The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 128, No. 7 — CHICAGO, ILLINOIS — JUNE 16, 1945

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THE FLUID AND NUTRITIONAL THERAPY OF BURNS

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The National Research Council and the Office of Scientific Research and Development have authorized the release of this memorandum containing suggestions for the use of oral and parenteral fluids and food in the treatment of burns. To the medical officer who has had experience with the treatment of burned patients it will be evident that the suggested outline is somewhat dogmatic. However, the main purpose of the outline is to aid the medical officer with little or no experience in the management of such cases. It is hoped that the discussion of the rationale for giving the suggested fluids will be helpful as a guide to the recommended therapy. Coincident with this fluid and nutritional therapy, local burn treatment in conjunction with parenteral penicillin and oral sulfonamide therapy should be directed toward the prevention and control of burn sepsis, but the latter items are not dealt with in this discussion, important as they may be.

CATEGORY OF PATIENTS WHO SHOULD BE GIVEN SPECIAL FLUIDS AND FOOD ACCORDING TO THIS OUTLINE

Following damage to the skin by a burn there is a loss of extracellular fluid, including salts and plasma proteins, both into the burned area itself and as a discharge from any denuded surface. With this fluid loss there will be dehydration, a decrease in the circulating plasma volume and hemoconcentration (i. e. apparent increase in the number of red cells in the whole blood).

In mild burns spontaneous ingestion of fluids and food according to the desires of the patient is usually adequate, but in more severe injuries special methods of therapy are necessary to aid convalescence and to save lives. It is generally agreed that in burns which involve less than 10 per cent of the body surface there is not sufficient loss of extracellular fluid to warrant intensive fluid therapy.

Hence this discussion is directed to those patients with more than 10 per cent of the body surface involved by second degree (blistered) or third degree (coagulated or charred) burns. Roughly, then, this outline would be followed in patients with a severe burn of at least one of the following areas: (1) face and neck, (2) dorsal or ventral surface of chest, (3) dorsal or ventral surface of abdomen, (4) one upper extremity, (5) dorsal or ventral surface of one lower extremity. If there is any question as to whether the patient should be included in this category, he should be. Patients with burns involving less than 10 per cent of the body surface and with, in addition, any other injury, particularly wounds or fractures, should be treated as though they were in this category. Exceptions to this statement are (1) head injuries, (2) perforating wounds of the chest and (3) burns of the pharynx, larynx or lower air passages (a face burn should make one suspicious of such respiratory involvement). In these instances excessive fluid administration may bring on pulmonary edema. If many burn casualties are seen, it is often advisable to treat energetically those patients with a large surface area involved (30 to 40 per cent) and then treat the less seriously burned patients as time is allowed; further, in patients with burns weeping much plasma, it must be remembered that they will need internal infusions more regularly than will those patients with burns showing little or no seepage.

The course of the severe and inadequately treated burn patient can be divided into three dangerous phases:

1. *The Period of Shock* (to forty-eight hours after the burn).—The signs of burn shock are often very misleading until just before collapse occurs. Thus, shock is often present when a patient looks and acts quite well. Generalized vasoconstriction may keep the blood pressure at satisfactory levels even though cardiac output is greatly diminished. Therefore in the early hours the presence of shock is to be assumed in all severely burned patients despite a satisfactory clinical appearance. If one waits for cold extremities, cyanosis and collapsed veins, therapy is apt to be ineffective. This period of shock (to forty-eight hours after burn) is also essentially the period of vigorous fluid therapy. Subsequently adequate fluid therapy and vigorous food therapy may be indicated, but in a case treated sufficiently during the first two days there is no routine indication for extensive forcing of fluids after that time.

2. *The Period of Toxemia* (from forty-eight to one hundred and twenty hours, occasionally as late as the third week).—Fever, jaundice, anuria, stupor and delirium and circulatory collapse despite adequate fluid therapy are often associated with this syndrome. With full realization of the inadequate state of our present knowledge of the cause of burn toxemia, it may how-

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ever be helpful to consider it tentatively as due to one or more of the following conditions:

(*a*) Inadequate treatment of shock or treatment not instituted early enough with consequent ischemic damage to kidneys, liver or other organs. For example, failure to maintain blood volume by plasma and/or whole blood administration. In other instances loss of electrolytes and fluid from burned surface, also from vomiting and sweating with consequent dehydration and acidosis may be an etiologic factor.

(*b*) Excessive administration of electrolyte (noncolloid) solutions with consequent dilution of plasma proteins to the edema level (less than 5 Gm. of protein per hundred cubic centimeters). This is particularly dangerous if there is associated renal and/or cardiac damage.

(*c*) Accompanying infection of burned areas.

(*d*) It has been suggested that there is absorption from burned tissues of protein products which are "toxic." If this occurs the effect will be minimized by maintaining an adequate blood supply to all the body tissues, i. e., a normal blood volume with normal hemoglobin concentration and adequate renal function.

3. *The Period of Burn Anemia and Hypoproteinemia.*—The anemia and hypoproteinemia develop first during the first seventy-two hours but are usually not evident until the signs of toxicity have largely disappeared. Actual red cell destruction with hemolysis, hemoglobinemia and hemoglobinuria soon after the burn is a cause of early masked anemia. It is likely that failure to maintain nutrition is the most important factor in the production of both and every effort, therefore, should be made to keep the burned patient in nitrogen equilibrium throughout the illness.

CRITERIA TO BE USED AS A GUIDE TO FLUID THERAPY

Fluid therapy in burns should be directed toward two major objectives: (A) rapid replacement of acute deficits and (B) maintenance of daily needs.

A. Rapid replacement of acute deficits:

1. Restoration and maintenance of a normal blood volume.

2. Restoration and maintenance of an adequate hemoglobin concentration (13 to 16 Gm. per hundred cubic centimeters).

3. Restoration and maintenance of plasma protein concentration above 6.0 Gm. per hundred cubic centimeters.

4. Restoration and maintenance of a satisfactory urinary output, usually 100 cc. per hour during the first forty-eight hours.

5. Prevention of dehydration and acidosis. (Determination of plasma bicarbonate concentration by the method of Van Slyke is a useful index of acidosis.)

6. Prevention of salt depletion. (Determination of plasma chloride concentration by the method of Van Slyke may be used to determine approximate salt depletion.)

7. Avoidance of overadministration of electrolyte (noncolloid) solutions by the parenteral route.

B. Maintenance of daily normal fluid and nutritional requirements of water, salt, carbohydrate, protein and other substances.

OUTLINE OF FLUID THERAPY IN BURNS

I. *Early Acute Burns* (up to forty-eight hours): *The Prevention and Treatment of Burn Shock.*—Fluids are given in this phase for three purposes: (1) to restore blood volume and to treat shock (chiefly plasma and blood), (2) to provide extra fluid to compensate for loss from burned surfaces and as edema of injured tissues (plasma and salt solutions) and (3) to provide additional fluid for adequate urinary excretion (water and salt solutions or dilute salt solutions). In a severe burn (30 to 40 per cent of the body surface or more) the volumes involved for the forty-eight hour period are roughly (1) 2,000 cc., (2) 4,000 to 10,000 cc., (3) 2,000 to 3,000 cc. Replacement therapy in the first forty-eight hours thus involves fluid volumes of these magnitudes, totaling 8,000 to 15,000 cc. for the forty-eight hour period. With the larger volumes, close watch should be kept for circulatory congestion.

A. *Intravenous Therapy.*—1. Plasma: Whole plasma is the colloid solution of choice; it supplies fluid and electrolyte as well.

(*a*) The dosage of plasma is best gaged by previously suggested formulas which depend on hemoconcentration, size of burn and, of especial importance, the clinical response of the patient. The depth of the burn is of little practical value as a guide for this purpose.

(*b*) It is best not to give all of the indicated amount of plasma at one time. Even if clinical shock is severe, usually one third of the complete dose is sufficient at first, other equal doses being given over the succeeding four or five hours.

(*c*) When acute collapse occurs, the first dose of plasma should be given rapidly. Since in these circumstances there is an acute failure of venous return to the heart, the fluid introduced must to a considerable extent supply this venous return. An initial introduction of 200 to 300 cc. in the first two minutes is not too rapid; the administration should be continued, up to 1,000 cc. or more, until a satisfactory clinical response is obtained. Subsequent amounts should be given more slowly. In shock, time is extremely important; if plasma or whole blood is not immediately available, give intravenous electrolyte solution (physiologic electrolyte solution or isotonic solution of sodium chloride if the former is not available) rapidly until plasma and whole blood are secured. By the term physiologic electrolyte solution is meant a mixture of 2 parts of normal isotonic (one-sixth molar) (0.9 per cent) sodium chloride solution with 1 part of normal isotonic (one-sixth molar) (1.3 per cent) sodium bicarbonate solution. If sodium bicarbonate solution is not available, sodium lactate normal isotonic (one-sixth molar) (1.75 per cent) solution may be substituted. The final mixture is of the following concentration in round numbers: sodium chloride (one-tenth molar, 0.6 per cent, 100 millimols per liter) and sodium bicarbonate (one-twentieth molar, 0.5 per cent, 50 millimols per liter) or, if sodium lactate is used in place of the bicarbonate, sodium lactate (one-twentieth molar, 0.6 per cent, 50 millimols per liter).

(*d*) Plasma is of little value beyond the third day and is seldom needed after the first twenty-four hours if the treatment during that period has been adequate. Its chief role is in large surface area burns (over 10 per cent of the body surface) and during the first forty-eight hours.

(*e*) Technic of intravenous therapy: Insert a large (no. 16 or 18) hypodermic needle into the vein, withdraw 5 cc. of blood, fix the needle in place with adhesive tape and start intravenous fluids. The blood is placed in a test tube containing 5 mg. of a 3:2 mixture of ammonium and potassium oxalate. From this blood sample is obtained the whole blood specific gravity

(see later for method). The remainder is saved for typing and cross matching and if possible a portion is centrifuged or allowed to sediment so that the plasma specific gravity can be determined. After the initial plasma infusion in all patients in whom there is any likelihood of the development of shock or in whom accessible veins are scarce, it is desirable to leave the intravenous infusion needle in place, maintaining its patency with a slow infusion of physiologic electrolyte solution or other available isotonic solution.

(*f*) If superficial arm veins are inaccessible, femoral vein puncture, saphenous vein cannulization in the foot, ankle, leg, or even at the fossa ovalis, or intramedullary injections may be necessary.

Representative Formulas:

(*a*) Formulas dependent on extent of hemoconcentration:

(1) Give 150 cc. of plasma for each specific gravity increase of 0.001 above the normal whole blood specific gravity [1] of 1.060 (i. e., if the specific gravity of whole blood is 1.070, give 1,500 cc. of plasma); (2) or give 100 cc. of plasma for each point the hematocrit exceeds the normal of 45 (i. e., if the hematocrit is 60, give 1,500 cc. of plasma); (3) or 50 cc. of plasma for each point the hemoglobin exceeds the normal of 100, or 300 cc. of plasma for each gram the hemoglobin exceeds the normal of 15 Gm. per hundred cubic centimeters (i. e., if the hemoglobin is 130 per cent or 20 Gm. per hundred cubic centimeters give 1,500 cc. of plasma); (4) or 100 cc. of plasma for each 100,000 the red cell count exceeds the normal of 5,000,000 per cubic millimeter (i. e., if the red cell count is 6,500,000 give 1,500 cc. of plasma).

All formulas based on blood concentration-hematocrit and so on may at times be in serious error. For example, in the first hour or so after the injury the hematocrit may still be normal, plasma loss having just started. In such a case the hematocrit repeated at the third and sixth hours gives a truer picture of the condition. Other patients may be anemic at the time of injury or because of associated wounds. No matter what formula is used, the corresponding dosage for children should be less and is roughly proportionate to the body weight. It should be remembered that formulas dependent on hemoconcentration show only the needs of the patient at the time of testing, not all his requirements during the entire course of the burn.[2]

(*b*) Formula dependent on the area of the burn: Give 50 cc. of plasma for each per cent of the body surface involved by a deep (blistering) burn during the first twelve hours. Often more plasma must be given later. Burns of the face, groin or buttocks usually lose more plasma than the surface involvement indicates, and more plasma should be given accordingly. Very few persons with less than 10 to 15 per cent of the body surface burned will require plasma transfusions.

2. Albumin: Iso-osmotic human albumin solution is a satisfactory substitute for blood plasma in comparable dosages of protein. With concentrated albumin solutions, saline solution should be given in addition.

3. Whole Blood Transfusions: In patients with a hematocrit below 60, give 500 cc. of compatible whole blood for every thousand cubic centimeters of plasma administered. In any case in which plasma is not available, whole blood is better than intravenous electrolyte solutions.

Rh typing is mandatory in all burn cases which show transfusion reactions on repeated transfusion. It is desirable in all cases of deep burns of more than 20 per cent of the body surface in which repeated transfusions may be needed. The use of Rh negative blood for females under 40 years of age is advisable.

4. Electrolyte Solutions: (*a*) Burns of less than 10 per cent of the body surface: Give 2,000 cc. of physiologic electrolyte solution each twenty-four hours, preferably by mouth; if not, by vein.

(*b*) Burns of more than 10 per cent of the body surface: Chief reliance for prevention or relief of shock is placed on plasma (or albumin or whole blood), as indicated.

However, additional amounts of saline and glucose solutions should also be given parenterally to patients unable to take adequate amounts by mouth or to extensively burned patients in whom the required intake by mouth may be excessive, i. e. more than 8 liters in any twenty-four hour period. The physiologic electrolyte solution or its equivalent should be used. Some of this fluid should also contain glucose, about 100 to 200 Gm. daily. To give average figures, the volume of electrolyte solution given intravenously will be roughly the same as the volume of plasma in the first two days. It will be larger or smaller, depending on the success of oral therapy, but should not exceed 4,000 cc. in any twenty-four hour period.

B. *Oral Therapy.*—As already indicated, oral therapy with crystalloid solutions is chiefly to provide fluid for surface loss and local edema and for adequate urine volume. Water and non-salt containing fluids, such as milk and ginger ale, can be given up to 2,000 cc. a day to aid renal function; no more than this quantity should be given until all of the required electrolyte solution has been swallowed and retained. After this has been accomplished, water can be given ad libitum in controlled and reasonable amounts.

The following suggestions are made for the administration of oral fluids in the first forty-eight hours:

(*a*) Burns of less than 10 per cent of the body surface: Give 2,000 cc. of physiologic electrolyte solution each of the first two days.

(*b*) Burns of more than 10 per cent of the body surface: Give 3,000 to 8,000 cc. of physiologic electrolyte solution the first day, depending on the extent of the burn.

Give 3,000 cc. of physiologic electrolyte solution the second day.

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1. Use of the copper sulfate method for determination of specific gravity: This method rapidly and accurately estimates the hemoglobin concentration. Since plasma protein concentration in burns is usually either normal or low (from lost plasma proteins) a specific gravity of the whole blood above 1.060 indicates abnormally high hemoglobin due to deficient plasma volume. With normal or low plasma proteins a specific gravity for whole blood of 1.060 indicates (1) a hematocrit of 45 or more per cent cells, (2) a hemoglobin concentration of 15 or more grams per hundred cubic centimeters of whole blood and (3) a red blood cell count of 5,000,000 or more cells per cubic millimeter.

Injection of plasma and whole blood should be regulated to keep the hemoglobin concentration in the patient's blood down to 15 Gm. per hundred cubic centimeters or the specific gravity of the whole blood down to 1.060.

Plasma protein concentration: The protein concentration in plasma can be quickly estimated from the specific gravity of the plasma as determined by the "copper sulfate method" from the formula $P = 360 (G_p - 1.007)$, where P is the plasma concentration in grams per hundred cubic centimeters and G_p the specific gravity of the plasma. The factor 1.007 is the correction needed for the nonprotein constituents of the plasma. If serum is used instead of plasma the loss of the fibrinogen results in values 0.2 Gm. per hundred cubic centimeters lower than the plasma values.

2. The normal plasma protein range is from 6.3 to 7.7 Gm. per hundred cubic centimeters with an average of 7 Gm. per hundred cubic centimeters, which latter value corresponds to a specific gravity of 1.0264. In burns a hyperproteinemia is not usual and is encountered only in the initial two to three hours and only in patients who have received no fluids and are dehydrated. A hypoproteinemia is the rule. The level may fall so low (below 5 Gm. per hundred cubic centimeters) that general edema results. If possible the protein concentration should not be allowed to drop below a level of 6.0 Gm. per hundred cubic centimeters (plasma specific gravity of 1.024).

1. Such oral therapy should be started immediately on admission before local treatment is begun and while waiting for parenteral therapy. However, in severe shock oral fluids should be started cautiously, as absorption may be slow and there is danger of vomiting and aspiration. In such cases, as already indicated, parenteral therapy must be begun at the earliest possible moment, while oral administration should not be pushed until the patient is out of shock.

2. If, after recovery from acute shock, the patient vomits, a quantity of physiologic electrolyte solution equal to the vomitus should be given again. If this happens repeatedly, oral fluid should be temporarily discontinued, but an attempt should be made to give electrolyte solutions again after a two to three hour rest period. In cases in which the stomach is loaded with food or lack of veins makes oral administration obligatory, preliminary washing out of the stomach to prevent aspiration of solid food, followed by Levine tube fluid administration by steady drip, may be advisable.

3. A definite schedule of oral fluid administration in terms of cubic centimeters per hour should be set up and closely followed to avoid overloading the stomach in an attempt to catch up, if enough fluid is not given in the first six hours. In severe burns, 200 to 400 cc. of fluid should be given regularly on the hour during the first eighteen to twenty-four hours. Usually very large volumes of fluid are tolerated in the first two days after injury. Contraindications are (*a*) the presence of thermal burns of the throat, larynx or lower air passages (a face burn should make one suspicious of such involvement), (*b*) presence of the casualty in a conflagration in an enclosed space where inhalation of toxic gases may have occurred and (*c*) in the aged or cardiac patient, when too vigorous fluid administration may increase the tendency to pulmonary edema. A reduced intake of electrolyte solutions and plasma and the substitution in part of whole blood is considered preferable therapy in such cases.

4. The urinary output is one important indication of the adequacy of fluid therapy. An attempt should be made to maintain the urinary output above 100 cc. per hour during the first forty-eight hours. Obviously at the beginning of treatment fluids administered will pass into dehydrated and injured tissues, and anuria for a matter of hours is not uncommon. With the schedule of treatment already described, however, urine output should start up at least after four or five hours and increase to the 100 cc. per hour level shortly thereafter. An inlying catheter may be useful to follow this more closely. It should be realized, however, that following shock, especially if prolonged, kidney damage may have occurred. If therapy as described does not open up the kidneys, excessive parenteral fluid, especially large quantities of intravenous saline solution, will not do so either but will only dilute blood and body fluids. A key measurement here is the plasma protein concentration, which should not be allowed to fall below 5.0 Gm. per hundred cubic centimeters (plasma specific gravity 1.021).

5. Treatment of Acidosis: If the severely burned patient has received no fluid therapy for several hours after the time of injury, acidosis is not infrequent; this is particularly likely if the patient has been in shock for any length of time. Acidosis should be promptly treated. Normally the carbon dioxide content of the plasma is about 60 volumes per cent.

For each volume per cent the plasma carbon dioxide is less than 55 volumes per cent in a 60 Kg. man give one of the following: (1) 40 cc. of 4 per cent sodium bicarbonate intravenously; (2) 125 cc. of 1.3 per cent (isotonic) (one-sixth molar) sodium bicarbonate orally or intravenously; (3) 125 cc. of 1.75 per cent (isotonic) (one-sixth molar) sodium lactate orally or intravenously; (4) 375 cc. of physiologic electrolyte solution (the larger dosage is necessary since, to prevent alkalosis when administered in large quantities, this solution is purposely made with only one-third the potential bicarbonate—and hence only one-third the antiacidotic power—as is contained in the one-sixth molar solutions).

Example: If the plasma carbon dioxide is 35 volumes per cent, 2,500 cc. of 1.3 per cent sodium bicarbonate should be given orally or intravenously. Such fluid should be given in place of rather than in addition to an equal volume of other fluid such as oral saline solution.

II. *Late Burns* (after forty-eight hours): *The Prevention and Treatment of Burn Toxemia, Anemia and Hypoproteinemia.*—Toxemia may be present early and cause fatalities as late as the third week. Anemia and hypoproteinemia may exist from the first few days and are troublesome until granulating surfaces are completely epithelized. Electrolytes as well as protein are lost from granulating surfaces and should be replaced by an adequate intake of salt in the diet.

Danger of giving too much fluid in later stages of burns: There is a strong tendency in both the edema absorption stage and in the toxemia infection stage for plasma and blood volume to increase above normal when excessive fluid is given, with cardiac strain, general edema formation, decreased renal function and pulmonary edema.

The chief aims of fluid treatment at this stage are as follows:

1. Maintenance of fluid balance and of normal electrolyte balance, a continuation of that listed in I. After forty-eight hours some resorption of the local edema may be expected and it may be unwise to force fluids and electrolyte as vigorously as during the period of local edema formation. If the therapy in the first forty-eight hours has been adequate, a normal intake of fluid with supplemental fluid and salt to cover continued loss from the wound should prove adequate.

2. Control of anemia.

3. Maintenance of body protein.

These aims are accomplished by the following means:

A. *Intravenous Therapy.*—1. Plasma or albumin is seldom necessary after the second day. A 500 cc. plasma transfusion usually contains less than 30 Gm. of plasma protein; a severely burned patient needs 150 to 200 Gm. of protein a day. Hence, while plasma transfusions are helpful in combating hypoproteinemia, they are quantitatively insufficient to accomplish much in this regard.

2. Amino acid solutions, as now available, can usually be tolerated intravenously in amounts up to 100 to 150 Gm. of amino acids in a 10 per cent solution if administered slowly. They are helpful during the first week or longer (after shock has been relieved) in sustaining and restoring the patient's state of nutrition but are indicated only if the patient cannot take adequate proteins by mouth.

3. Whole blood transfusions are of especial value at this stage. Most open burn surfaces are accompanied by a continued red cell loss (loss from bleeding, from increased red cell destruction due to infection and from failure of adequate red cell regeneration). Plasma protein is also lost from open burn surfaces in large

amounts. Whole blood in large amounts and at frequent intervals combats anemia and hypoproteinemia and is one of the best means of maintaining resistance to infection.

The following rules are of help:

(*a*) Give enough whole blood to raise the hemoglobin to 85 (hematocrit to 40, red count to 4.7 million) and to keep it above this level. As much as 1,500 cc. of whole blood daily for several days may be necessary to correct severe anemia in burns.

(*b*) Five hundred cc. of whole blood every three to four days as long as the rectal temperature is above 102 F. or the plasma proteins are below 6.0 Gm. per hundred cubic centimeters.

(For rules concerning Rh typing in repeated transfusions see I, A, 3.)

4. Electrolyte solutions by vein are seldom necessary in the later stages of burns because the patient usually can take sufficient fluids by mouth. However, when this is not possible, adequate fluid balance should be maintained by the use of intravenous physiologic electrolyte solution in sufficient but not excessive amounts. Glucose in saline solution may be substituted for the physiologic electrolyte solution, and at all times a high carbohydrate intake (100 to 200 Gm. a day) is advisable. In the late stages of burns, with infection and low plasma protein, urine volume may diminish, with edema of the body tissues. Strenuous forcing of electrolyte solution then may only increase edema, without diuresis. Moderate fluid intake, with feeding and whole blood transfusions, constitutes the logical treatment.

B. *Oral Therapy.*—The immensely important problem of feeding during the often protracted period of infection and anemia cannot be adequately covered in this memorandum. Each case is an individual problem of dietetics and nursing. A full food intake, including calories, vitamins and especially protein, is essential. A few notes may be useful:

1. Total fluid intake should be sufficient to keep the urine volume 1,500 cc. or higher daily. If salt intake has been adequate, body proteins not too much depleted and heart and kidney function competent, this usually means an intake of between 3,000 and 4,000 cc. daily.

2. Salt (sodium chloride) intake should be maintained around 10 Gm. daily; a little higher if the burn is extensive with much exudate. Too much salt, however, promotes general tissue edema. Blood carbon dioxide tends to run somewhat low, and some alkaline salt is advisable. Try to keep the urine about neutral to litmus. The physiologic electrolyte solution 1,000 to 1,500 cc. daily will often be useful during the first five to ten days. Water can be given ad libitum after the fourth day.

3. Diet should be high in protein, carbohydrate, calories and vitamins. The protein intake should be added to with increasing areas of third degree burns as early as possible after the injury and probably by the end of the first week. Such protein intake should be of the following magnitudes: 5 to 10 per cent body surface burned, 125 Gm. of protein per day; 10 to 20 per cent of body surface burned, 125 to 200 Gm. of protein per day; more than 20 per cent of body surface burned, more than 200 to 300 Gm. of protein per day, provided the patient's gastrointestinal tract can tolerate these large amounts. The corresponding caloric intake should be approximately 3,000, 4,000 or 5,000 calories per day.

(*a*) Amino acids by mouth, 100 to 200 Gm. per day, are an effective form of protein intake but difficult to tolerate because of the bad taste. Few patients can take them for more than three or four days.

(*b*) An example of an adequate diet is the diet used by Evans, which is palatable by mouth but also can be given by tube, as follows: 150 Gm. of dehydrated meat powder, 150 Gm. of powdered whole milk, 50 Gm. of corn oil, 150 Gm. of sucrose, 150 Gm. of dextrimaltose, 35 Gm. of chocolate and 1,000 cc. of water (plus vitamins, especially A, B, C and D, and iron).

(*c*) Adequate vitamins and iron are essential in all unhealed burns. A suggested daily dosage is as follows for burns of 20 per cent area of third degree. Correspondingly smaller doses should be used for less severe burns: vitamin A, 20,000 units; vitamin B: thiamine hydrochloride, 40 mg.; riboflavin, 20 mg.; niacin amide, 50 mg.; vitamin C, 1 Gm.; vitamin D, 2,000 units; vitamin K, 1 mg.; ferrous sulfate, 1.5 Gm.

ALCOHOL INJECTION OF LUMBAR SYMPATHETIC TRUNK

IN CASES OF PERIPHERAL VASCULAR INSUFFICIENCY WHEN SURGICAL SYMPATHECTOMY IS CONTRAINDICATED

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The advantages of interrupting the sympathetic nerve supply to an extremity in which there is a circulatory deficiency due to vasospastic disease such as thromboangiitis obliterans or Raynaud's disease has been generally accepted, as a result of the pioneer work of Leriche [1] and the subsequent investigations of many American physicians.[2] The literature on this subject has been reviewed adequately at frequent intervals by White [3] and does not require general discussion at this time.

Unfortunately, some of the earlier publications dealing with peripheral vascular impairment of the extremities place too much emphasis on the differentiation between vasospastic disease and organic obliterative disease, and, as a result, many physicians regard the circulatory insufficiency of old age associated with arteriosclerosis as being an irreversible mechanical occlusion of the blood supply to the extremities. Ochsner and DeBakey [4] have emphasized the importance of realizing that even extreme cases of degenerative organic obliterative disease are aggravated by a certain amount of vasospasm and that the relief of this vasospasm is the one thing which can be accomplished by surgical treatment.

Read before the Section on Surgery, General and Abdominal, at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 14, 1944.

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2. Allen, A. W.: Results Obtained in the Treatment of Raynaud's Disease by Sympathetic Neurectomy and in Thromboangiitis Obliterans by Desensitization of Peripheral Sensory Nerves, Ann. Surg. **96:** 867 (Nov.) 1932. Flothow, P. G.: Diagnostic and Therapeutic Injections of the Sympathetic Nerves, Am. J. Surg. **14:** 591 (Dec.) 1931. White, J. C.: Diagnostic Blocking of Sympathetic Nerves to Extremities with Procaine, J. A. M. A. **94:** 1382 (May 3) 1930. Smithwick, R. H.: Modified Dorsal Sympathectomy for Vascular Spasm (Raynaud's Disease) of the Upper Extremity, Ann. Surg. **104:** 339 (Sept.) 1936. Ochsner and DeBakey.[4]

3. White, J. C.: Progress in Surgery of the Autonomic Nervous System in 1938 and 1939, Surgery **9:** 115 (Jan.) 1941; Progress in Surgery of the Autonomic Nervous System, 1940-1942, ibid. **15:** 491 (March) 1944.

4. Ochsner, Alton, and DeBakey, Michael: The Rational Consideration of Peripheral Vascular Disease Based on Physiologic Principles, J. A. M. A. **112:** 230 (Jan. 21) 1939.

Recently Mahorner [5] reported good results following lumbar ganglionectomy in persons up to 60 years of age suffering from vascular insufficiency, and Trimble and his associates [6] have published the report of their gratifying experience in a large number of persons in their fifth and sixth decades who were relieved of their vascular insufficiency by lumbar sympathectomy.

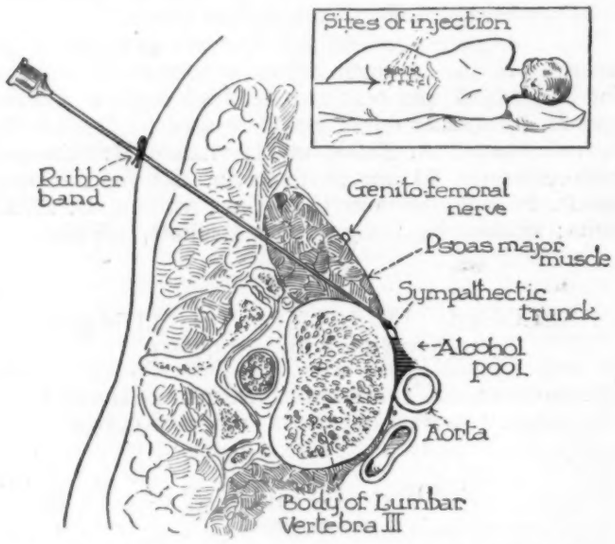

Fig. 1.—With the patient on the side the abdominal contents fall away from the vertebral column, creating a definite retroperitoneal space in the region of the sympathetic trunk. Gravity prevents the alcohol from coming in contact with the genitofemoral nerve.

My experience has coincided with that of Trimble, and we perform lumbar ganglionectomies on such patients when surgery can be tolerated with safety. A great many patients are seen, however, on whom surgery is definitely contraindicated because of heart disease, renal disease or both. In such cases I have resorted to a chemical sectioning of the sympathetic nerve supply to the lower extremities. This is accomplished by injecting sterile 95 per cent alcohol into the region of the lumbar sympathetic trunk. This procedure was undertaken with considerable misgiving because of the many reports of alcoholic neuritis following this type of injection. In some of my early cases alcoholic neuritis did develop but in the past three years I have encountered only 1 relatively mild neuritis of the genitofemoral nerve in a series of more than 150 cases. During this period it has been my practice to do an alcoholic injection of the lumbar sympathetic trunk on all patients suffering from arterial insufficiency of the lower extremities, regardless of their age or general physical condition, provided they were not considered good operative risks. Many patients with frankly infected gangrene have been injected, and it has been my impression that the procedure has enabled me to perform a satisfactory amputation at a lower level with better postoperative healing of the stump. I have had occasion to carry out the procedure on several aged patients, who were fibrillating and had developed saddle emboli of the lower abdominal aorta or of one of the femoral vessels. In these cases I have been able to relieve pain in almost every instance, and the improvement in circulation as a result of the interruption of the associated vasospasm of the collateral blood supply has been most striking. Very few of them have had to undergo amputation.

Many persons in their sixth, seventh and eighth decades have undergone bilateral alcoholic injection of the lumbar sympathetic trunks for relief of claudication and rest pain, and a majority of them have experienced relief from rest pain, much improved in claudication and a definite increase in their ability to walk. Most of those who had early pregangrenous areas on their great toes have overcome this tendency and have developed a healthier tissue in this region.

The following are presented as representative cases:

Case 1.—Mrs. W. H. P., aged 68, with hypertensive cardiovascular disease and severe generalized arteriosclerosis, suffered from rest pain in the calves for two years. Claudication had steadily increased and was so severe that she could not walk across her bedroom without resting. Two weeks prior to her first visit she developed trophic skin changes on the ends of the second and third toes of each foot. The only palpable pulse in the lower extremities was a very faint one at the femoral opening. Oscillometer readings were midcalf 0, midthigh ½ on both sides. During the past three days the patient had insisted on keeping her feet in a dependent position, and considerable edema developed. On Jan. 10, 1941 a bilateral alcohol injection of the first, second, third and fourth lumbar sympathetic ganglion was done. Following this injection the patient was relieved of her pain, and the gangrenous areas gradually healed, over a period of three weeks. Now, three and one-half years later, she is living and comfortable. There has been no recurrence of the gangrene or rest pain, and she can walk 100 feet without claudication.

Case 2.—O. S., a man aged 80 with hypertensive cardiovascular disease of fifteen years' duration with gradually increasing difficulty in walking, complained of cold feet, aches and cramps in the calf muscles during the night. All these symptoms were worse on the left side. For two weeks prior to admission a dark blue spot on the outer aspect of the left great toe became gradually larger, and for two days pus had been draining from it. Examination showed a fair pulse in both femoral vessels and a faint pulse in both popliteal vessels. There was no palpable dorsalis pedis or posterior tibial pulse. The feet were icy cold and white. There was an oscillometer reading of ½ in the midthigh. There was an infected gangrenous area of the skin on the great toe. On Dec. 16, 1942 a bilateral alcohol injection of the lumbar sympathetic trunk was done. The pain subsided immediately and the gangrenous areas cleared up promptly. The patient was last seen on Aug. 9,

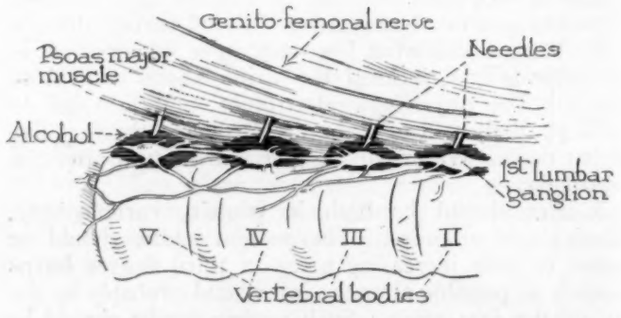

Fig. 2.—With the patient on the side the injected alcohol gravitates downward against the vertebral column and forms pools around the sympathetic trunk.

1943, when he came in to advise that he was having no trouble and was walking 10 miles daily.

Case 3.—J. W. E., a man aged 67, presented a painful, cold, weak right lower extremity. He had been aware of a pulsating mass back of the right knee for several months. The day before admission, while lifting a heavy object, he experienced a severe pain back of the knee, followed by blanching and cooling of the leg and foot. The pain was unbearable, and he was unable to stand on the extremity. A diagnosis of

5. Mahorner, Howard: Control of Pain in Post-Traumatic and Other Vascular Disturbances, Ann. Surg. **119**: 432 (March) 1944.
6. Trimble, I. R.; Cheney, W. S., and Moses, W. R.: The Operative Attack on Organic Peripheral Vascular Disease, Surgery **15**: 655 (April) 1944.

thrombosis of an aneurysm of the right popliteal artery was made, and an alcoholic injection of the right lumbar sympathetic trunk was done on Oct. 24, 1942. All pain was relieved and the temperature increased perceptibly. The next day the patient could walk on the extremity. On October 27 an obliterative endoaneurysmorrhaphy was done and the popliteal artery

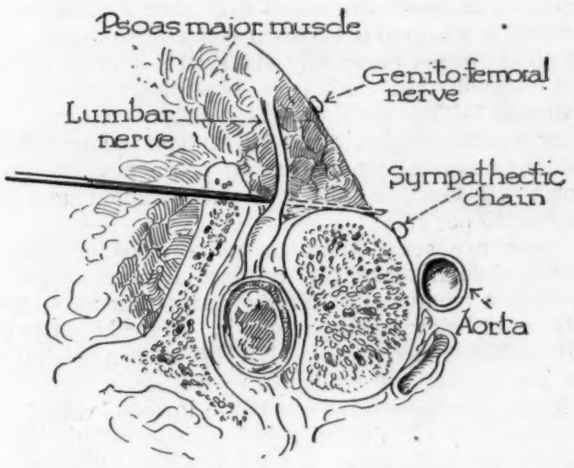

Fig. 3.—If the needle is not long enough, the alcohol may be injected into the substance of the psoas muscle and come into contact with the lumbar plexus. When the needle is inserted through the anterior surface of the psoas muscle, the muscle protects the lumbar nerves from the injected alcohol.

was ligated. The patient made an uneventful recovery and is now going about his usual activities. The right foot is warmer than the left one.

The technic that I employ for performing alcoholic injections is that which has been described by Ochsner and DeBakey[7] for infiltrating the same nerves with procaine, except that a few special precautions are taken in using alcohol which are not required in the use of procaine. As stated previously, the greatest hazard is associated with the danger of inadvertently allowing some of the injected alcohol to come in contact either with the genitofemoral nerve or with one or more of the lumbar nerve trunks (fig. 1). Damage to the genitofemoral nerve is avoided by placing the patient in a modified Sims position with the side to be injected turned up (fig. 2). In this position the injected alcohol pools against the side of the vertebral body and does not extend laterally over the anterior surface of the psoas muscle to come in contact with the nerve, which courses downward and laterally across the anterior surface of the muscle (fig. 3). The lumbar nerves emerge from the intervertebral foramens and pass into the substance of the psoas muscle. If the needle passes well through the substance of the muscle and into the retroperitoneal space, the danger of this complication is quite remote. The most frequent cause of trouble in this regard is the use of a short needle. The ordinary 2½ or 3 inch spinal needle is not long enough to reach the retroperitoneal space in a large, obese adult, and when such a needle is used there is danger of not penetrating the anterior surface of the psoas muscle. I use a special 22 gage 6 inch needle. This needle is inserted through a small piece of rubber band, which is used as a marker. When the tip of the needle strikes the posterior border of the transverse process I adjust the piece of rubber to a point 5 cm. from the skin surface and then insert the needle either above or below the transverse process until the rubber touches the skin. The needle is aspirated to make sure that the point has not been introduced into a blood vessel; then it is withdrawn about 0.25 cm. to avoid the possibility of injecting the solution into the wall of the aorta on the left or of the vena cava on the right. Not more than 2 cc. of 1 per cent procaine is injected slowly, the syringe is removed and a needle is inserted at the next level. Only 2 cc. of procaine is used because the creation of a pool of fluid at the end of the needle would dilute the alcohol which is subsequently injected and would possibly extend out over the psoas muscle to involve the genitofemoral nerve. By the time the second needle is put into position, adequate local anesthesia will have been obtained at the point of the first needle, and I then inject 2 cc. of sterile 95 per cent alcohol very slowly. About 0.25 cc. of procaine is then injected in order to clear the needle of alcohol and thereby avoid leaving any of the alcohol along the course of the needle as it is withdrawn. This injection is done at the level of the second, third, fourth and fifth spinous processes.

Following this procedure the patient is required to remain immobile for two hours to avoid any possibility of spreading the solution into an undesirable area. After two hours he is encouraged to resume his normal activities.

I determine the completeness of the sympathetic interruption by examining the extremity for moisture. If there is any perspiration on the involved extremity the procedure is repeated in two weeks.

It has been my experience that most of these injections are effective for at least six months and frequently for a year or more. One patient, who had a unilateral injection four years ago, still has a dry foot and leg on that side. I must have been fortunate enough in this case to effect an injection directly into the ganglions. I have encountered no contraindications to repeated injections, and reinjection is employed as often as it is indicated by the individual patient's clinical symptoms.

CONCLUSIONS

Paravertebral alcohol injection of the lumbar sympathetic ganglions is a relatively safe procedure when done carefully, and many inoperable persons suffering from arterial insufficiency of the lower extremities can be relieved by this relatively simple procedure. It is not advocated as a substitute for surgical sympathectomy but as a second choice when surgery is contraindicated.

333 Ingraham Building.

ABSTRACT OF DISCUSSION

DR. ARTHUR W. ALLEN, Boston: Interruption of the sympathetic pathways to the extremities has a definite place in the treatment of certain peripheral lesions, particularly those that have to do with vasospasm. In the arteriosclerotic group, particularly, and in a great many cases of thromboangiitis obliterans this procedure does have definite merit. In testing these patients before operation by procaine block it takes much longer to get evidence of vasodilatation in obliterative disease than it does in the cases in which the vessels themselves are normal. Any clinic that has had a large experience in this field has tried the alcohol injections that Dr. Lilly has presented. Many of us have practically discarded the method on the basis of the neuritis so often associated with it. Any one who will take the trouble and pains to carry out Dr. Lilly's exact technic may get good results and not have the complicating sequelae which have troubled some of us so much. It has been interesting to watch these elderly patients after they have had surgical interruption of their sympathetic pathways. The mortality has been extremely low. The serious sequelae have been surprisingly few. Recently, however, a man came to our hospital with an arteriosclerotic popliteal aneurysm. He was subjected to lumbar ganglionectomy, and then his

7. Ochsner, Alton, and DeBakey, Michael: Therapy of Phlebothrombosis and Thrombophlebitis, Arch. Surg. **40**: 208 (Feb.) 1940.

aneurysm was operated on and he was given heparin, as is the rule in our clinic following operations on the arteries. He developed a huge retroperitoneal hematoma, which contributed to his death. Possibly the heparin was started too soon. Perhaps it was unwise to use it in his particular case. However, if he could have had a chemical interruption of his sympathetics as described by Dr. Lilly, the probabilities are that he would be alive today. I wish to issue a slight warning about the wholesale and widespread sympathetic interruptions on arteriosclerotic obliterative disease in active persons who like to play eighteen holes of golf without having to rest on the fairways or who are troubled because they can walk only short distances at a time because of intermittent claudication. The operation is very popular at the moment and we may say to these patients "Why, yes, we can eliminate this cramp in your leg to a very large extent by doing this perfectly simple and safe operation of interrupting the lumbar sympathetic chain." These persons are spectacularly improved as far as the intermittent claudication is concerned. However, a certain number succumbed from coronary occlusion in an incredibly short period of months. It has led me to believe that perhaps if one is fortunate enough to develop arteriosclerosis that involves the lower extremities so that the chief handicap is that one must stop and rest while walking rather than stride forth as in previous years, it may be a protective mechanism of nature, and this should not be overlooked in dealing with this group of persons.

DR. GEORGE D. LILLY, Miami, Fla.: Three of my patients have developed coronary occlusion within a few months after satisfactory sympathetic block, although they had no coronary disease prior to the injection. It certainly seems reasonable to suppose that when they increase their activity they run some danger of precipitating a coronary occlusion. I do not feel that this complication is a contraindication to the procedure, especially if patients have severe pain or are threatened with gangrene; but I do believe it would be well to caution them against increasing their activity too much.

ANEMIA IN PREGNANCY

A CORRELATION OF THE PERIPHERAL BLOOD AND BONE MARROW FINDINGS

JOHN R. WOLFF, M.D.
AND
LOUIS R. LIMARZI, M.D.
CHICAGO

Since the circulating blood is affected by many physiologic processes (e. g. work, rest, food, exercise, emotion, infection), an analysis of the peripheral blood by capillary or vein puncture merely tells the state of the blood at the moment it is obtained. The bone marrow is more constant in its pattern and portrays both the present state of the blood organs and the immediate future of the peripheral blood. The correlation of these findings in both the bone marrow and the circulatory blood reveals the true state of the hemopoietic system.

As clinicians, we have difficulty in evaluating the blood findings commonly seen during pregnancy. Because the hemoglobin and erythrocyte values are lower than those seen in the nonpregnant individual, earlier workers thought that pregnancy produced a true anemia. They speculated that this was an iron deficiency anemia due to the demands of the fetus for iron from the mother.

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Read before the Section on Obstetrics and Gynecology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 14, 1944.

Owing to lack of space this article is abbreviated in THE JOURNAL. The complete article, including additional material, tables and photomicrographs, will appear in the authors' reprints.

Dieckmann and Wegner [1] found that the total blood volume was increased 23 per cent during pregnancy and that, although this increase is proportionately greater in the plasma content, the cellular content is also increased. They reported an increase in the total circulating hemoglobin and erythrocytes. However, the plasma is so greatly increased that when a small sample of blood is analyzed the cellular element is diluted. The apparent anemia previously observed is therefore not a true anemia but rather a physiologic anemia or hydremia. This work has been amply confirmed by other workers.[2] Adair and Dieckmann [3] state that the minimum normal figures during pregnancy are hemoglobin 10 Gm., erythrocytes 3.36 million and cell volume 33 per cent.

There are some investigators who do not believe that hydremia alone can produce figures as low as those just mentioned. Whitby [4] says that an erythrocyte count below 4.0 is pathologic. Bethell [5] states that 3.70 million red cells and 11.3 Gm. of hemoglobin are the lowest that will explain a hydremia.

Many clinicians believe that the lowered values seen in pregnancy are due to a lack of iron.[6] This lack is thought to be due either to a withdrawal of the mother's iron reserve for the fetus, to the lack of iron in the diet or to the prevention of its absorption by the change in the gastric secretion during pregnancy.[7] Many clinicians have routinely treated pregnant women with iron in one of various forms and have noted higher erythrocyte and hemoglobin levels in those treated than in control cases.[6] Yet others [8] have found that iron did not affect these values at all.

RESULTS

Physiologic Anemia of Pregnancy.—Thirty patients were examined throughout pregnancy. These normal healthy pregnant women were first seen during the first six to ten weeks of pregnancy. At this time the peripheral blood and bone marrow were examined as described. The peripheral blood was reexamined every four weeks until delivery, shortly after delivery and at the six weeks postpartum visit. The bone marrow was reexamined in many cases during the second and third trimester, in all cases shortly after delivery and in most cases at the final six weeks postpartum visit.

1. Dieckmann, W. J., and Wegner, C. R.: The Blood in Normal Pregnancy: I. Blood and Plasma Volumes, Arch. Int. Med. **53:** 71 (Jan.) 1934.

2. Thompson, K. J.; Hirsheimer, A.; Gibson, J. B., Jr., and Evans, W. A., Jr.: Studies on the Circulation in Pregnancy: III. Blood Volume Changes in Normal Pregnant Women, Am. J. Obst. & Gynec. **36:** 48 (July) 1938. Miller, J. R.; Keith, N. M., and Rowntree, L. G.: Plasma and Blood Volume in Pregnancy, J. A. M. A. **65:** 779 (Aug. 28) 1915. Stander, H. J., and Creadick, A. N.: Blood Volume in Pregnancy, Bull. Johns Hopkins Hosp. **35:** 1 (Jan.) 1924. Oberst, F. W., and Plass, E. D.: Water Concentration of the Blood During Pregnancy, Labor and the Puerperium, Am. J. Obst. & Gynec. **31:** 61 (Jan.) 1936.

3. Adair, F. L.; Dieckmann, W. J., and Grant, K.: Anemia in Pregnancy, Am. J. Obst. & Gynec. **32:** 560 (Oct.) 1936.

4. Whitby, L. E. H., and Britton, C. J. C.: Disorders of the Blood. ed. 4, Philadelphia, Blakiston Company, 1942, p. 238.

5. Bethell, F. H.: The Blood Changes in Normal Pregnancy, J. A. M. A., **107:** 564 (Aug. 22) 1936.

6. Strauss, M. B., and Castle, W. B.: Etiology and Treatment of the Anemia of Pregnancy, J. A. M. A. **102:** 281 (Jan. 27) 1934. Linder, G. C., and Massey, P. J.: Some Factors Bearing upon the Hemoglobin Level in Pregnancy, J. Obst. & Gynaec. Brit. Emp. **46:** 885 (Dec.) 1939. Corrigan, J. C., and Strauss, M. B.: The Prevention of Hypochromic Anemia in Pregnancy, J. A. M. A. **106:** 1088 (March 28) 1936. Lobate, J. S.: Classification and Treatment of the Anemias of Pregnancy, Am. J. Obst. & Gynec. **31:** 640 (July) 1939. Toland, O. J.: The Incidence of Secondary Anemia in Out-Patient Maternity Patients, ibid. **31:** 640 (April) 1936.

7. Strauss, M. B., and Castle, W. B.: Studies of Anemia in Pregnancy: Gastric Secretion in Pregnancy and the Puerperium, Am. J. M. Sc. **184:** 655 (Nov.) 1932. Strauss, M. B., and Castle, W. B.: Studies of Anemia in Pregnancy: The Relationship of Dietary Deficiency and Gastric Secretion to Blood Formation During Pregnancy, ibid. **194:** 25 (Jan.) 1931. Strauss and Castle.[6] Linder and Massey[6] Corrigan and Strauss.[6]

8. Cornell, E. L.: Personal communication to the authors of unpublished data. Evans, E. G.: Anemia in Pregnancy, Illinois M. J. **84:** 317 (Nov.) 1943. Adair, Dieckmann and Grant.[3] Dieckmann and others.[20]

Peripheral blood and bone marrow analysis were also made on 75 other healthy women at various stages of their pregnancy.

The findings in the peripheral blood are in agreement with those of previous investigators (table 1). There is a lowering of the values of hemoglobin, erythrocytes

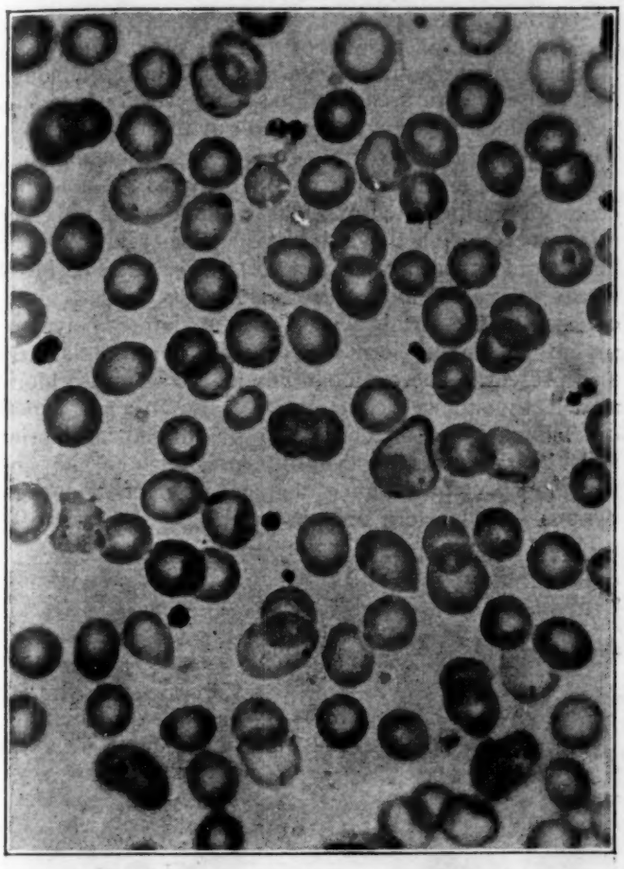

Fig. 1.—Normal pregnancy: peripheral blood, showing the normocytic normochromic anemia.

and hematocrit beginning in the third and fourth months of pregnancy. This is much increased by the sixth and seventh month and persists in our series until after delivery. By the sixth postpartum week the blood has returned to normal levels. We note that the mean corpuscular volume is normal throughout pregnancy. In a few cases the volume of the cell on one or two examinations would be small and in other cases somewhat macrocytic, but the average cell throughout pregnancy was normal in size and volume. The mean corpuscular hemoglobin concentration is in the lower limits of normal. Since 32 to 36 per cent is considered the range of normal hemoglobin concentration it would be difficult to state that the erythrocytes are deficient in iron during pregnancy. The larger group of individual cases examined at various months of pregnancy reveal findings similar to those as observed in the same patients (30) throughout pregnancy. The leukocytes were usually within the normal range, but many patients showed a slight leukocytosis at varying times during the pregnancy. The latter fact has been previously noted by Litzenberg and others.[11] We also found an increase in the sedimentation rate, especially in the last trimester, with a rapid return to normal following delivery. The icterus index remained normal throughout pregnancy. In contrast with observations of other investigators,[12] we failed to note an increase in the reticulocytes during pregnancy. The differential smear showed little variation from normal. The erythrocytes always appeared normal in size and shape and in staining quality throughout the pregnancy. In most cases the percentage of polymorphonuclear leukocytes was increased toward the end of pregnancy and there was slight increase in stab forms noted in many instances. The leukocytosis of labor (polymorphonuclear in type) was evidenced by a mild leukocytosis noted during the puerperium. The leukocytes were normal at the sixth postpartum period. The blood platelets are normal or slightly increased.

The bone marrow of normal pregnancy shows no change in the character of normal erythropoiesis. The characteristic cell is that of the polychromatophilic normoblast. The latter type of the erythroid element is exactly like that seen in normal healthy nonpregnant women. There is definite evidence of increased myelopoiesis during the first and second trimesters. During the latter part of pregnancy, especially in the last month of gestation and during the puerperium, there is a pronounced myeloid hyperplasia with a tendency toward granulopoietic immaturity. The megakaryocytes are normal or slightly increased in number during the early months of pregnancy, but during the latter months of

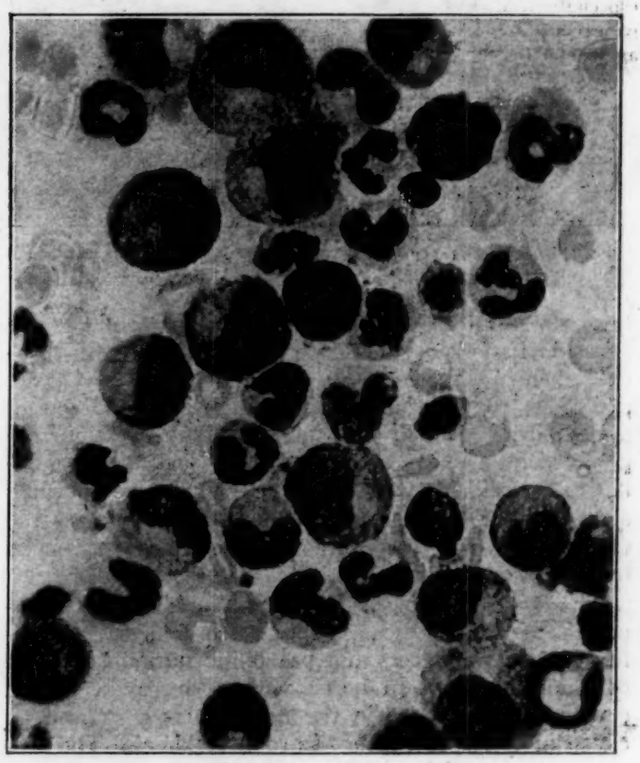

Fig. 2.—Normal pregnancy: bone marrow, showing normal erythropoiesis and myeloid hyperplasia.

pregnancy and especially in the early puerperium there is an evident megakaryocytic hyperplasia of a mature type. There is also a decided increase in the number of bone marrow platelets. This myeloid hyperplasia and megakaryocytic hyperplasia does not entirely return

11. Carey, J. B., and Litzenberg, J. C.: Total Leucocyte Counts in Human Blood During Pregnancy, Ann. Int. Med. **10**: 25 (July) 1936. Eskridge, J. B., Jr., and Serwer, M. J.: Blood Studies in Private Obstetrical Patients During Pregnancy, South. M. J. **32**: 24 (Jan.) 1939. Wolff, J. R.: The Leucocyte Count in Labor, Am. J. Obst. & Gynec. **41**: 611 (March) 1941.

12. Pitts, H. H., and Packham, E. A. Hematology of Sternal Marrow and Venous Blood of Pregnant and Nonpregnant Women, Arch. Int. Med. **64**: 471 (Sept.) 1939.

to normal until some three months following delivery despite the relative earlier readjustment of the peripheral blood.

Iron Deficiency Anemia (table 2).—Ten cases were observed. Table 2 shows the average findings in this group. The essential feature is a cell deficient in

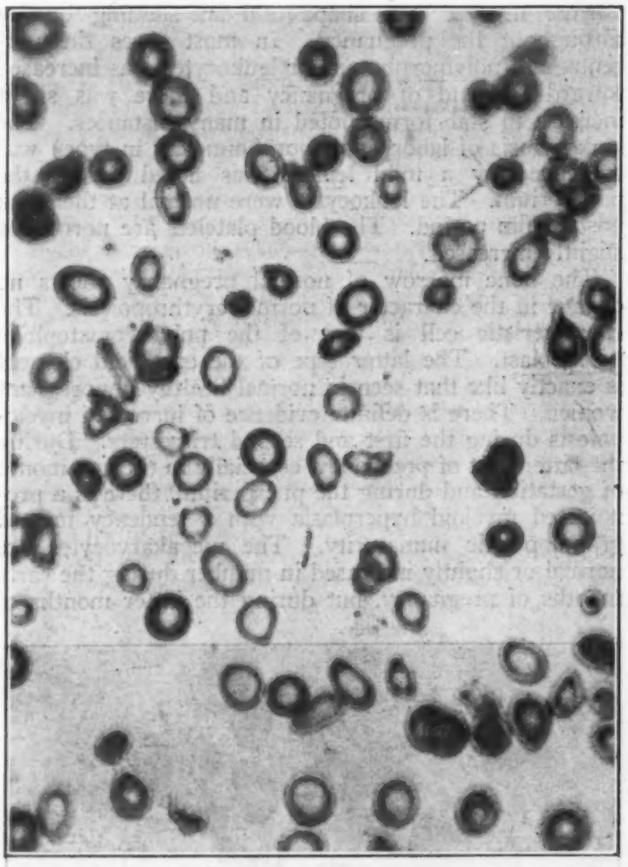

Fig. 4.—Iron deficiency anemia: peripheral blood, showing the microcytic hypochromic anemia.

hemoglobin, the so-called hypochromic anemia. The hemoglobin falls well below 10 Gm. and the erythrocyte count and hematocrit reading are below those applicable to that of the physiologic changes seen in pregnancy. Calculation of the mean corpuscular hemoglobin concentration shows a decided lack of hemoglobin in the cell. In 4 cases the cell volume was normal, a normocytic hypochromic anemia and in 6 cases the cell volume was considerably lowered, a microcytic hypochromic anemia.

The bone marrow shows a normoblastic erythropoiesis with the presence of a greater or smaller number of pronormoblasts and basophilic normoblasts, but of a normal type. In 1 case with a severe anemia the erythroid hyperplasia in the bone marrow showed an exceedingly large number of pronormoblasts. The pronormoblasts and basophilic normoblasts are only infrequently encountered in bone marrow smears of normal patients and those with the physiologic changes due to pregnancy. A myeloid hyperplasia and megakaryocytic increase is noted in these cases similarly to that described.

When iron was not given to these patients (6) the peripheral blood and bone marrow remained constant as described. When iron was given to these patients (4) the peripheral blood and bone marrow returned to normal. Without iron the bone marrow does not return to normal until six months after delivery.

Four cases of mild anemia (hemoglobin below 10 Gm. and erythrocytes below 3.50 million) were observed in which the cell size was small but the hemoglobin concentration was normal. The bone marrow showed a normal erythroid pattern.

Macrocytic Anemia of Pregnancy (table 3).—Three cases of anemia of pregnancy and the puerperium were observed with a megaloblastic bone marrow quite identical with that seen in addisonian pernicious anemia.

In the first case it was the ninth month of pregnancy. The peripheral blood showed 4 Gm. of hemoglobin, 1.15 million erythrocytes and a hematocrit of 13 per cent. The mean corpuscular volume of 113 cubic microns revealed the macrocytic type of cell. The hemoglobin concentration was 30 per cent. The blood smear revealed moderate anisocytosis and poikilocytosis of the erythrocytes and moderate polychromasia. So-called pernicious anemia neutrophils were also present. There was an abundance of hydrochloric acid in the stomach contents following an alcohol meal or following the injection of histamine hydrochloride subcutaneously. The smooth tongue, splenomegaly and neurologic complications characteristic of true pernicious anemia were not observed.

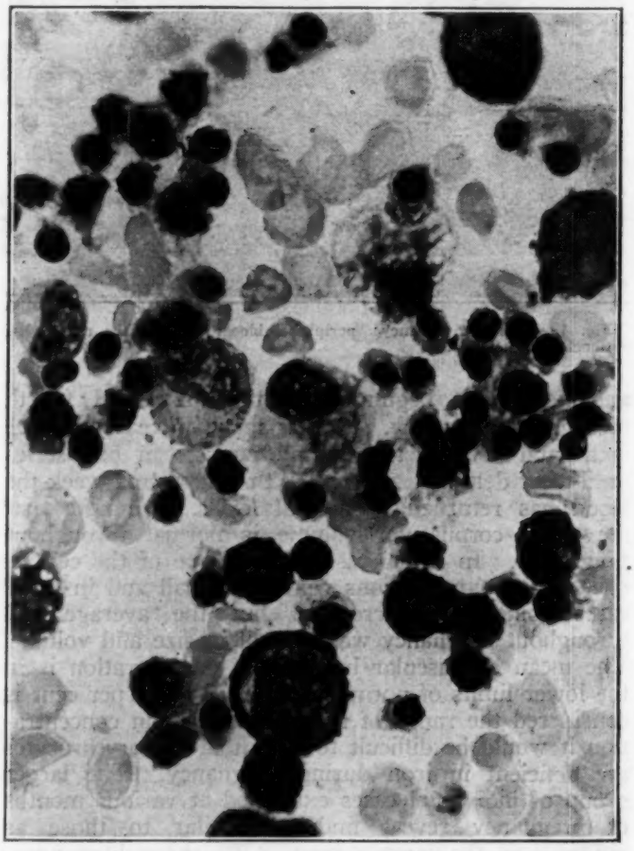

Fig. 5.—Iron deficiency anemia: bone marrow, showing the normoblastic hyperplasia.

The bone marrow was characterized by the presence of megaloblasts. This is a pathologic type of erythropoiesis which occurs in the bone marrow only in pernicious anemia and related anemias due to a deficiency of the liver principle. This type of marrow is never seen under normal conditions. Megaloblasts are distinctly different from the early forms of normoblasts

(pronormoblasts) and are characterized by a more distinct chromatin network, more parachromatin, more rapid accumulation of hemoglobin in proportion to the maturity of the cell and almost always by a larger cell. Jones [13] has discussed in detail the distinguishing features of both normoblasts and megaloblasts in relation

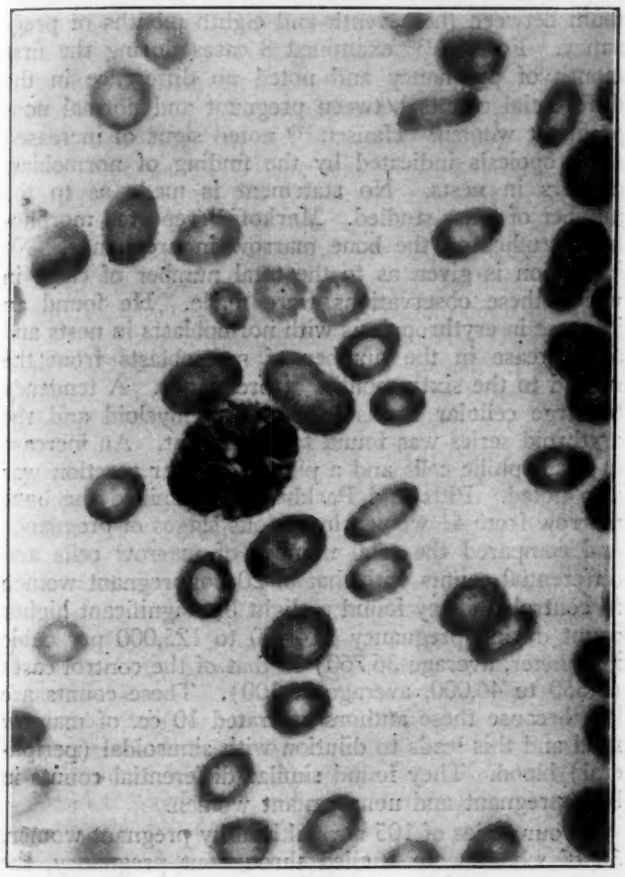

Fig. 8.—Pernicious anemia of pregnancy: peripheral blood, showing a pernicious anemia neutrophil (macropolycyte).

to their nuclear pattern and cytoplasmic changes. Limarzi [14] has demonstrated that megaloblasts are arsenic sensitive, while pronormoblasts as seen in normal bone marrow and in the bone marrow in most cases of anemia with an erythroid immaturity are arsenic resistant. The bone marrow in those cases of so-called pernicious anemia of pregnancy also present a pathologic type of granulopoiesis characterized by large hyperpolymorphic neutrophilic promyelocytes, myelocytes and metamyelocytes. These types develop in the pernicious anemia neutrophils (macropolycytes) of the peripheral blood.

In the second case the peripheral blood showed the hemoglobin to be 4.5 Gm., red cell count 1.27 million and the hematocrit 12 per cent. Thus the mean corpuscular volume is 94 cubic microns, which is well within normal limits. The mean corpuscular hemoglobin concentration is 35 per cent. One would classify this as a normocytic normochromic anemia, and the etiology and therapy would be somewhat obscure. However, the bone marrow findings were those of a typical megaloblastic anemia as already described.

In the third case the peripheral blood showed the hemoglobin 5.5 Gm., erythrocytes 2.48 million and hematocrit 19 per cent. The mean corpuscular volume was 76 cubic microns and the mean corpuscular hemoglobin concentration was 28 per cent. From the study of the peripheral blood alone one would classify this case as a microcytic hypochromic anemia. That is, it would be considered an iron deficiency anemia and treated accordingly. However, the bone marrow again revealed a true megaloblastic anemia typical of the cases just described.

Intramuscular liver therapy is needed in these cases with a megaloblastic marrow. Following this treatment there is a tremendous proliferation of normoblasts in the bone marrow. Megaloblasts rapidly mature and no new megaloblasts are formed. The action of the liver principle on the megaloblasts is probably to effect the elimination and suppression of their further proliferation.[15] It is not clear how liver extract effects stimulation of the normoblastic tissue. Apparently once the pathologic megaloblastic tissue has been eliminated and suppressed, normoblastic erythropoiesis can assume its normal physiologic function and the anemia in the peripheral blood is corrected. In cases of megaloblastic anemia (pernicious) of pregnancy the conversion of the bone marrow from a megaloblastic to a normoblastic type of erythropoiesis following liver therapy is slow. These cases do not respond as well as

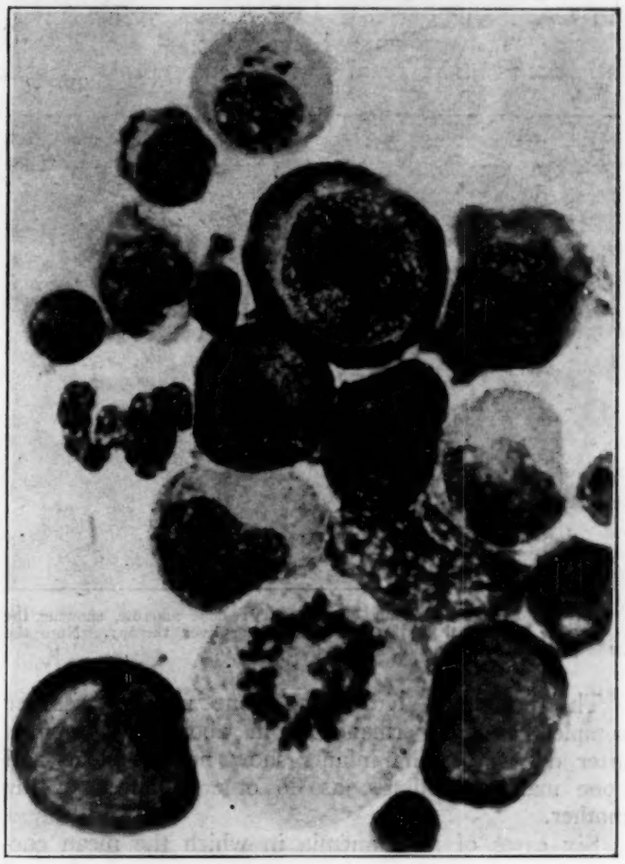

Fig. 9.—Pernicious anemia of pregnancy: bone marrow, showing the megaloblastic type of erythropoiesis and abnormal granulopoiesis. Note the presence of a mitotic figure in one megaloblast.

13. Jones, O. P.: Cytology of Pathologic Marrow Cells, with Special Reference to Bone Marrow Biopsies, in Downey, Hal: Handbook of Hematology, New York, Paul B. Hoeber, Inc., 1938, vol. 3, p. 2045.

14. Limarzi, L. R.: The Effect of Arsenic (Fowler's Solution) on Erythropoiesis: A Contribution to the Megaloblast Normoblast Problem, Am. J. M. Sc. **206**: 339 (Sept.) 1943.

15. Fieschi, A.: Semeiologia del midollo osseo: Studio di morfologia clinica, in Ferrata, A.: Biblioteca "Haematologica," Pavia, Tipografia gia Cooperativa, 1938. Limarzi, L. R., and Levinson, S. A.: An Undescribed Type of Erythropoiesis Observed in Human Sternal Marrow, Arch. Path. **36**: 127 (Aug.) 1943.

cases of addisonian pernicious anemia until after the birth of the child and for some time after the puerperium.

It requires large daily doses of potent intramuscular liver extract and several blood transfusions to bring about a satisfactory recovery phase. The reticulocyte response is never as high as that seen in addisonian pernicious anemia at the equivalent stage of blood and bone marrow findings. In 1 case the pathologic granulopoiesis disappeared more rapidly than the megaloblastic erythropoiesis, while in the other 2 the granulopoiesis was last to disappear, similar to that seen in addisonian anemia. The megakaryocytes were hypoplastic before treatment but increased with treatment.

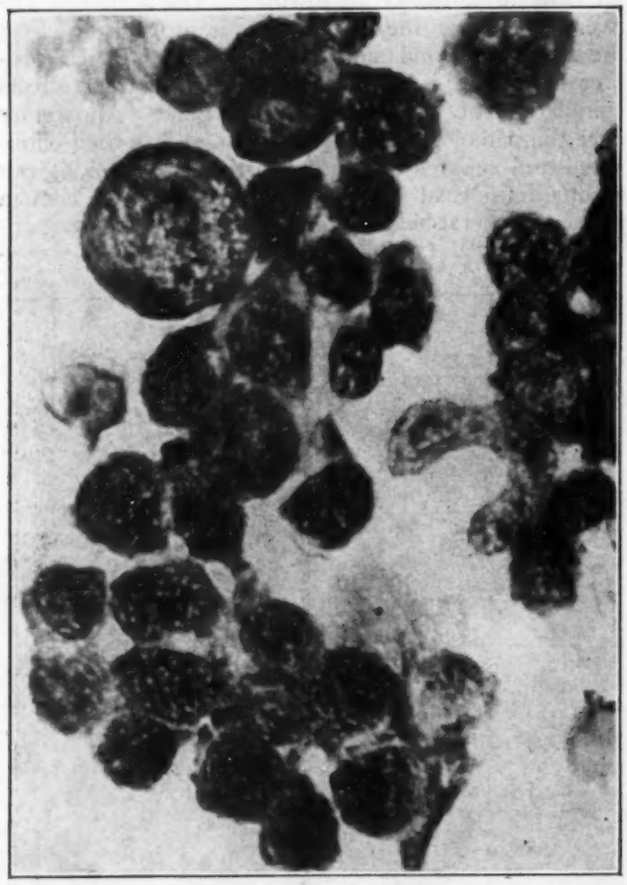

Fig. 10.—Pernicious anemia of pregnancy: bone marrow, showing the conversion to normal erythropoiesis following liver therapy. Note the large pathologic neutrophilic metamyelocyte.

The peripheral blood and bone marrow recover completely and permanently in about five months after delivery. The infants show normal blood and bone marrow findings, as do other children of the mother.

Six cases of mild anemia in which the mean corpuscular volume revealed a macrocytic type of cell were observed. The mean corpuscular hemoglobin was either normal or slightly below normal. The bone marrow was normal in all respects except for a mild myeloid hyperplasia. In some instances there was a mild erythropoiesis with the presence of a few immature forms (pronormoblasts), but megaloblasts were never found. In these cases recovery followed delivery, although iron was given in those in which there was a lowered hemoglobin concentration.

PHYSIOLOGIC ANEMIA

The bone marrow of normal pregnancy has been studied by several investigators. Daniachij [16] examined the sternal marrow of 50 women during different stages of pregnancy and the puerperium. He found an increase in the number of neutrophilic metamyelocytes and a megaloblastic type of reaction which reached its maximum between the seventh and eighth months of pregnancy. Forssell [17a] examined 8 cases during the first month of pregnancy and noted no difference in the differential counts between pregnant and normal nonpregnant women. Hansen [17b] noted signs of increased erythropoiesis indicated by the finding of normoblast clusters in nests. No statement is made as to the number of cases studied. Markoff [18] reported morphologic studies on the bone marrow in pregnancy. No indication is given as to the total number of cases in which these observations were made. He found an increase in erythropoiesis with normoblasts in nests and an increase in the number of macroblasts from the second to the sixth months of pregnancy. A tendency to large cellular forms in both the myeloid and the erythroid series was found to be present. An increase in eosinophilic cells and a plasma cellular reaction was also noted. Pitts and Packham [13] examined the bone marrow from 41 women in various stages of pregnancy and compared the total number of marrow cells and differential counts with that of 20 nonpregnant women as controls. They found a slight but significant higher count during pregnancy (14,400 to 125,000 per cubic millimeter, average 36,760) to that of the control cases (7,550 to 46,000, average 23,100). These counts are low because these authors aspirated 10 cc. of marrow fluid and this leads to dilution with sinusoidal (peripheral) blood. They found similar differential counts in both pregnant and nonpregnant women.

In our series of 105 normal healthy pregnant women, 30 of whom were studied throughout pregnancy, the bone marrow constantly revealed a normal pattern of erythropoiesis. This is further evidence that the normocytic anemia in the peripheral blood is not a true one but due to hydremia. In fact we must agree with those who prefer dropping the status of "anemia" from these patients and in its place instituting normal standards of the blood during pregnancy which will naturally differ from the accepted nonpregnant standards. According to Adair [8] 89 per cent of all pregnant women are in this group. No treatment of any type is necessary. Iron medication is of no value, as the cells are well concentrated with iron. Studies of the iron content of the blood show normal findings during pregnancy.[19] The bone marrow, as stated, shows evidence of an entirely normal erythropoiesis.

An increased myelopoiesis was observed early in pregnancy. This became more pronounced during the last months of pregnancy. This hyperplasia is reflected in two ways: 1. By a pronounced bone marrow cell

16. Daniachij, M. A.: Schwangerschaft und Hämatopoiesis, Zentralbl. f. Gynäk. **60**: 1220 (May 23) 1936; Pathologische Schwangerschaft und Hämatopoiesis, **60**: 1998 (Aug. 22) 1936; Blutbildung und klinischer Verlauf der Graviditätsänamien, Monatschr. f. Geburtsh. u. Gynäk. **100**: 328, 1935.

17a. Forssell, J.: Morphologische Veränderungen im Knochenmark und Blut bei akuten Blutungsanämien, Acta med. Scandinav., 1939, supp. 101, p. 1.

17b. Hansen, R.: Ueber die Funktion des Knochenmarkes in der Schwangerschaft, Ztschr. f. Geburtsh. u. Gynäk. **116**: 398, 1938.

18. Markoff, N.: Das Knochenmark bei normaler und pathologischer Schwangerschaft (Ergebnisse der Sternalpunktion), Ztschr. f. Geburtsh. u. Gynäk. **119**: 13, 1939.

19. Dieckmann, W. J.: Calcium, Phosphorus and Nitrogen Balances in Pregnant Women, Am. J. Obst. & Gynec. **47**: 357 (March) 1944.

volume in the hematocrit. The normal myeloid-erythroid volume is approximately 6.8 per cent. The average during pregnancy was 14 per cent, with values as high as 45 per cent noted. 2. By an increase in the number of nucleated bone marrow cells. Normally the bone marrow of an adult woman contains approximately 300,000 cells per cubic millimeter,[20] while during pregnancy the average is about 600,000 per cubic millimeter with figures as high as 1.0 million often noted. Apparently homoplastic myelopoiesis is accelerated and the insignificant myeloid immaturity observed near the end of pregnancy does not involve the mechanism of heteroplastic myelopoiesis. The slight to moderate leukocytosis observed in the peripheral blood is practically always of the polymorphonuclear neutrophilic type and rarely if ever shows signs of myeloid immaturity.

The megakaryocytic hyperplasia of the bone marrow is only occasionally reflected in the peripheral blood by a great increase in the number of platelets. The mechanism for the rapid and immediate formation of large quantities of platelets is present in the bone marrow, especially during the last months of pregnancy and the puerperium. The relationship of megakaryocytic hyperplasia with the formation of large numbers of blood platelets to the control of postpartum bleeding, the tendency to phlebitis in the puerperium and the increased blood coagulability noted in those with an eclamptogenic toxemia is an interesting speculation.

These hyperplastic changes in the bone marrow and peripheral blood during pregnancy are merely a part of similar physiologic changes noted in every other organ of the body during pregnancy. The bone marrow does not return to normal for at least six weeks after delivery. It thus takes longer to recover than does the peripheral blood and is therefore a finer indicator of complete physiologic adjustment following pregnancy than are the blood or physical findings in this respect. The baby born of the mother shows normal blood and bone marrow findings.

IRON DEFICIENCY ANEMIA

In the cases of hypochromic anemia, especially with a microcytic cell, the bone marrow shows a definite normoblastic hyperplasia with a moderate to pronounced erythroid immaturity to include many more basophilic normoblasts and pronormoblasts than are seen in normal bone marrows. Markoff [18] in cases of microcytic anemia observed a normoblastic erythropoiesis with frequent macronormoblasts. Segerdahl [21] observed a similar type of marrow in her cases of pregnancy with an iron deficiency anemia (sideropenia). The factors that contribute to this type of anemia are similar to those contributing to this state in nonpregnant individuals. That is, the chronic loss of blood (e. g. epistaxis, menorrhagia, hemorrhoids, ulcer) preceding the pregnancy, the lowering of the gastric acidity during pregnancy and dietary alterations alone or in combination tend to produce this anemia. Following the replacement of iron therapeutically, an adequate diet and in some cases diluted hydrochloric acid the bone marrow returns to normal and the anemia in the peripheral blood is corrected. It is interesting that the babies from these mothers show normal peripheral blood and bone marrow findings.

In all cases of evident true anemia or those falling at or just below the level of minimum standard during pregnancy, the key to iron therapy is the mean corpuscular hemoglobin concentration. Every such case deserves a complete investigation of the peripheral blood. The simple hematocrit reading should always be obtained along with the erythrocyte count and the hemoglobin level. The mean corpuscular hemoglobin concentration can then be established. When this index is below normal, iron is indicated. We believe that ferrous sulfate 15 grains (1 Gm.) daily is the best preparation.

MEGALOBLASTIC ANEMIA OR PERNICIOUS ANEMIA OF PREGNANCY

True addisonian pernicious anemia is rare during pregnancy, although many of Biermer's patients were pregnant women. Much of the older reports of pernicious anemia in pregnancy are incomplete not only because of the lack of present rigid diagnostic criteria, especially bone marrow studies, but because any grave or severe anemia was called pernicious. Thus many of the older reports must be looked on with great suspicion. Much of the literature on the blood in the macrocytic anemias of pregnancy has been reviewed by Sodeman.[23] Bone marrow examinations are lacking in practically all of these cases of macrocytic anemia reviewed by him.

In our 3 cases of pernicious anemia of pregnancy megaloblasts were observed in all the bone marrows. Our patients were all white women in the ninth month of pregnancy. Besides the megaloblasts the bone marrow revealed a pathologic type of granulopoiesis. This is characterized by large hyperpolymorphic neutrophilic promyelocytes, myelocytes and metamyelocytes as described by Jones [30] in typical cases of pernicious anemia. These cells develop into the pernicious anemia neutrophils (Cook's [31] macropolycytes) of the peripheral blood.

The finding of a megaloblastic bone marrow in the presence of either a macrocytic, a normocytic or a microcytic peripheral blood is most interesting. Segerdahl,[22] Lambin and de Weerdt,[32] Callender [29] and Davidson, Davis and Innes [33] have reported similar types of cases. The latter investigators have suggested the name "megaloblastic anemia of pregnancy." The clinical importance of the analysis of the bone marrow as obtained by sternal puncture in all cases of severe anemia during pregnancy is obvious. Also in such severe anemias one may be misled by the findings in the peripheral blood from discrepancies produced by invariable technical errors, whereas the sternal marrow analysis is simple and devoid of such a happening. Our patients with megaloblastic anemia responded to adequate liver therapy and blood transfusions.

SUMMARY

The normal status of erythropoiesis in the bone marrow shows that the physiologic anemia of pregnancy is not a true anemia and thus rules out the need of routine therapy. The cause of the pronounced myeloid and megakaryocytic hyperplasia is not entirely clear. It

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21. Segerdahl, Elsa: Pernicious Anemia of Pregnancy: A Clinical and Hematological Study, Acta med. Scandinav. **108:** 483, 1941.
23. Sodeman, W. A.: Anemia in Prgnancy, Am. J. M. Sc. **200:** 117 (July) 1940.
30. Jones, O. P.: Origin of Neutrophils in Pernicious Anemia (Cook's Macropolycytes), Arch. Int. Med. **60:** 1002 (Dec.) 1937.
31. Cook, W. E.: The Macropolycyte, J. Lab. & Clin. Med. **19:** 453 (Feb.) 1934.
32. Lambin, P.; and de Weerdt, W.: Sur l'existence dans l'anémie pernicieuse d'un stade initial sans mégaloblastose médullaire, Sang **13:** 928, 1939.
33. Davidson, L. S. P.; Davis, L. J., and Innes, J.: Megaloblastic Anemia of Pregnancy and Puerperium, Brit. M. J. **2:** 31 (July 11) 1942.

may be that the granulocytic cells in the living state or their products act as a productive mechanism during pregnancy and the puerperium. The findings of a polymorphonuclear leukocytosis and thrombocytosis during the latter part of pregnancy, labor and the puerperium can be definitely correlated to the findings in the marrow. It is interesting to note that the bone marrow is apparently the last organ to return to a normal state following delivery.

In the hypochromic anemia of pregnancy the conspicuous finding of a disturbance in the erythroid tissue in the form of normoblastic hyperplasia and immaturity but morphologically normal cells speaks for an iron deficiency anemia. The microcytic hypochromic anemia will respond to therapeutic doses of iron. In cases of microcytic normochromic anemia (small cell with normal hemoglobin saturation) and a normal bone marrow iron therapy is of little value. Following delivery the anemia will correct itself spontaneously.

The macrocytic anemia with a normal or pronormoblastic bone marrow will in most instances clear up spontaneously during the puerperium. A normal hemoglobin concentration contraindicates the use of iron, but when this index is low iron should be administered. The absence of megaloblasts rules out pernicious anemia of pregnancy, and liver is not indicated.

In the pernicious anemia of pregnancy with megaloblastic bone marrow and a macrocytic anemia in the peripheral blood, the diagnosis is obvious and the treatment is clear. Large doses of intramuscular liver extract and supportive blood transfusions will carry the patient through the pregnancy and the puerperium. Unless the megaloblasts have been purged from the bone marrow by liver extract, the anemia in the peripheral blood will not be corrected. These cases are refractory to iron medication. Following delivery recovery is apparently complete and permanent, although these women should be observed during future pregnancies and following the menopause for the development of true pernicious anemia. The findings of a normocytic or microcytic and hypochromic anemia may be misleading unless the bone marrow is examined and the presence of megaloblasts observed. It can be said that hypochromic anemia with a normoblastic bone marrow will respond to iron and that a hypochromic anemia with a megaloblastic bone marrow will respond only to anti-pernicious anemia therapy. The fact that these cases respond to liver therapy emphasizes the need for recognizing genuine megaloblasts in the bone marrow in order to determine the correct type of therapy. Perhaps the unexplained success that some clinicians have reported in the treatment of hypochromic anemia with liver extract has been due to the existence of a condition like this. The presence of pernicious anemia neutrophils in the peripheral blood smear prior to the development of a macrocytic blood picture emphasizes the importance of a careful qualitative study of cellular morphology. The presence of these atypical neutrophils in the blood aids in differentiating pernicious anemia of pregnancy from microcytic or normocytic types of hypochromic anemia.

CONCLUSIONS

Four types of bone marrow and peripheral blood patterns are observed during pregnancy:

1. A normocytic normochromic anemia in the peripheral blood. The bone marrow shows a normal erythroid pattern with a myeloid and megakaryocytic hyperplasia toward the end of pregnancy. The physiologic anemia is a normal state during pregnancy and is due to hydremia. Recovery is spontaneous during the puerperium. No therapy is needed.

2. A microcytic hypochromic anemia with a normoblastic hyperplasia in the bone marrow. Adequate iron therapy corrects the bone marrow and the anemia. Occasionally a mild microcytic normochromic anemia with a normal or normoblastic bone marrow is observed. No treatment is necessary as recovery follows delivery.

3. A macrocytic anemia with a normal or pronormoblastic bone marrow. Recovery follows delivery. Iron is indicated only when the mean corpuscular hemoglobin concentration is low.

4. A megaloblastic type of bone marrow with either a macrocytic, normocytic or microcytic and hypochromic peripheral blood pattern. Adequate liver therapy and supportive blood transfusions are needed to carry the patient through the pregnancy. Complete and permanent recovery usually follows. Atypical neutrophils (macropolycytes) in the peripheral blood are a diagnostic aid.

The most accurate criteria for the diagnosis and treatment of the true anemia of pregnancy is the study of the sternal marrow. The changes in the peripheral blood are of a secondary nature and in many instances are misleading.

The close cooperation of the hematologist and obstetrician is essential to the proper management of the anemic state seen during pregnancy.

1853 West Polk Street, Chicago 12.

ABSTRACT OF DISCUSSION

DR. WILLIAM J. DIECKMANN, Chicago: Our trained technicians working with 75 to 150 patients a day, using the Newcomer method, had an error in the hemoglobin determination of 8.7 per cent. With special care this error was 4 per cent. The routine erythrocyte count had an error of 13.7 per cent, while with special care the error was 2 per cent, but the hematocrit, using heparin, had an error of only 2 per cent. Furthermore, the hemoglobin concentration in the same individual, with careful determinations, can fluctuate as much as 15 per cent from hour to hour. More than one hemoglobin determination must be made to establish a diagnosis of anemia or of normality for the patient. The paper contains no data as to how quickly the patient's hemoglobin improves during pregnancy with either liver injections or iron. Our experience at the Chicago Lying-In Hospital, where we have over 2,000 clinic visits monthly, is that 63 per cent are anemic as judged by the standards for the nonpregnant (that is less than 12 Gm. of hemoglobin, 36 hematocrit or 4,200,000 red blood count) or 12 per cent are anemic as judged by the standards for pregnancy (that is less than 10 Gm. of hemoglobin, 33 per cent hematocrit or 3.36 million erythrocytes). We have been giving both ferrous and ferric iron and various proprietary preparations of iron containing liver, stomach and vitamin extracts. Any medication must show a higher percentage of cure and a more rapid return to the normal than our group of controls. We are still using various combinations of iron and other substances in an endeavor to find some substance that will cause improvement of anemia in pregnancy. After delivery or in the nonpregnant woman an adequate iron intake in an iron deficient anemia will cause an appreciable increase in hemoglobin within two weeks. We have seen no such increases in anemic pregnant women. Antepartum care is valuable, but a hemoglobin determination made in the last month is of more value than one made in the third month,

and for the past year we have been insisting on a hemoglobin determination within the month preceding delivery. It is hard for me to believe that the fetal needs for iron are the cause for the anemia of pregnancy and that the pregnant woman must have an increased intake of iron prior to twenty-eight weeks. The incidence of anemia was much higher in our ward patients than in our private patients, and my impression is that in the past few years the incidence has decreased in the ward patients. Patients who are found to have a hemoglobin of less than 10 Gm. per hundred cubic centimeters at delivery are watched carefully to prevent excessive blood loss and the preliminary preparations for transfusion made. If the hemoglobin is less than 9, the patients are transfused either before or directly after delivery. Transfusion entails a risk from incompatible blood, which has become a real one since the war because of the inexperience of the resident staff. Nevertheless, transfusions are carried out because the anemic patient is particularly susceptible to puerperal infection.

DR. HOWARD L. ALT, Chicago: These interesting observations of Dr. Wolff and Dr. Limarzi show that the peripheral blood is not always an index of the bone marrow pattern. I don't think the day is far off when the sternal marrow differential will be almost as routine a procedure as the peripheral blood differential is today. In interpreting the blood count in pregnancy, it is of utmost importance to define the limits of normal. The most common so-called anemia of pregnancy which I see is in the woman in the sixth to eighth month who has a red count in the neighborhood of 3.3 million and hemoglobin of 10 Gm. According to most standards, this degree of depression should not be called anemia; it represents the lower limits of normal. Such patients frequently have low normal counts, i. e. a red blood cell count of about 4.0 million and hemoglobin of 12 Gm. for years preceding the pregnancy. The iron deficiency anemia seen during pregnancy practically always antedates the period of gestation. We know that iron deficiency is common in women during the childbearing period. A hemoglobin of 11.0 Gm. might be disregarded before pregnancy, but, as the hydremia of pregnancy progresses, further lowering of the hemoglobin attracts the attention of the obstetrician and the case is then diagnosed as an iron deficiency anemia. The amount of iron stored in the fetus, placenta and uterus is not sufficient to produce a real iron deficiency anemia if the woman had a normal reserve before she became pregnant. The megaloblastic anemia of pregnancy described is obviously not a true addisonian anemia. The patients had free hydrochloric acid, and 2 did not have macrocytosis. Further, they had a normal icterus index and did not respond in the usual manner to liver extract. I wonder if there is a relationship between this syndrome and so-called primary refractory anemia or achrestic anemia that has been described in the literature. I have seen 1 such instance in a male with a megaloblastic marrow and a hypochromic anemia in the peripheral blood. Further studies of this interesting syndrome occurring during pregnancy are warranted. Of course, besides these three anemias of pregnancy one should also think of the anemias that occur in nonpregnant women. About six weeks ago I saw a woman four and a half months pregnant with a red blood cell count of 1.5 millions. Complete studies revealed the presence of a subacute leukemia. She died four weeks later. If she had lived another six weeks or so it might have been possible to obtain a live infant.

DR. FRANK H. BETHELL, Ann Arbor, Mich.: There are two or three points that I should like to make in connection with this hematologic study by Drs. Wolff and Limarzi. What is the true incidence of anemia in pregnancy? I do not believe that a definite statement can be made because the incidence and severity of anemia in pregnancy varies with the group of patients under observation, depending on economic status, type of antepartum care and a number of other factors. In a group of 484 women in modest economic circumstances whom my associates and I studied at monthly intervals during pregnancy and for a year after delivery we found an incidence of true anemia of 28 per cent, and of those about four fifths were of the hypochromic type. As far as the etiology of these anemias is concerned, I do not share the view that the subject is entirely obscure. I think that iron deficiency in pregnancy can readily be explained. It is largely accounted for by preexisting depletion of iron in young women due either to repeated pregnancies or to hypermenorrhea, or to dietary deficiency. In our subjects, who were studied carefully from the point of view of diet, we found that if the daily food iron habitually taken before pregnancy and during the early months of pregnancy exceeded 15 mg. there was no incidence of hypochromic anemia, but the diet of only about 10 per cent of the group insured that amount of iron intake. On the other hand, about a third of the subjects were habitually receiving less than 8 mg. of iron a day, and of these 36 per cent had hypochromic anemia. My associates and I have previously demonstrated that the protein content of the diet bears an important relationship to the incidence of anemia in pregnancy, particularly of the normocytic and macrocytic types. We have evidence indicating that dietary deficiencies are responsible for the majority of the common anemias in pregnancy and that dietary control is an essential part of adequate antepartum management.

DR. LOUIS R. LIMARZI, Chicago: A great deal of the discussion concerning the anemias of pregnancy is due to poor or incomplete studies of the peripheral blood. One should be cautious in calling an anemia normocytic, microcytic or macrocytic on the basis of a hemoglobin determination and erythrocyte count alone and without the determination of the volume of packed red cells (hematocrit). From a physiologic and therapeutic point of view the accurate method of determining the type of anemia during pregnancy is from a study of the bone marrow by sternal aspiration. This is a simple and practical procedure. In the physiologic normocytic anemia of pregnancy erythropoiesis is normal and iron medication cannot be expected to affect either the anemia in the peripheral blood or the red cell forming tissue in the bone marrow. On the other hand, if the bone marrow reveals a normoblastic hyperplasia and a microcytic and hypochromic anemia in the peripheral blood, iron medication is indicated. This will be followed by a correction of the anemia and the erythroid hyperplasia of a normal type in the bone marrow. The megaloblastic anemia of pregnancy, or, a better term, the megaloblastic marrow of pregnancy is of interest from a diagnostic and a therapeutic point of view since the anemia in the peripheral blood may be macrocytic, normocytic or microcytic. The response to treatment is confusing in the latter 2 instances if the blood alone is studied. If iron is given the anemia does not respond. This is a refractory anemia in a limited sense but should not be confused with true refractory anemia (aplastic anemia with a hypoplastic or hyperplastic bone marrow). The microcytic hypochromic anemia with a megaloblastic marrow will respond to liver therapy. There is no question that many men have encountered cases of this type and have been at a loss to explain the lack of any response following iron therapy but a definite response with liver preparations. A microcytic hypochromic anemia with a normoblastic hyperplasia (normal erythropoiesis) will respond to iron medication, and a microcytic hypochromic anemia with a megaloblastic type of erythropoiesis (pathologic) will react only to liver therapy. The finding of "P. A. polys" in the blood will aid in differentiating a megaloblastic marrow from a normoblastic marrow when the anemia is microcytic and hypochromic in type. Our cases with a slight macrocytic anemia and a normal or hyperplastic marrow of either a myeloid or an erythroid (normoblastic) type recover spontaneously following delivery. These cases are rare in the clinic.

Diseases in the Malay States.—The diseases of greatest importance in the Malay States are malaria, typhoid fever, amebic dysentery, bacillary dysentery, intestinal helminthiasis, the venereal diseases (syphilis, gonorrhea, chancroid, lymphogranuloma venereum and granuloma inguinale), typhus fever, pneumonia, influenza, tuberculosis, dengue fever, filariasis, injuries caused by heat, and diseases of the skin, particularly fungous infections.—Simmons, James S., and others: Global Epidemiology, Philadelphia, J. P. Lippincott Company, 1944.

TAMPONS AS MENSTRUAL GUARDS

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Month by month the "curse" hangs over one seventh of a woman's active life. If strung along in sequent days, the flow would carry on for five full years. Yet of the thirty-five years of menstrual periods, the first six or seven and the last eight or ten are times in which pregnancy is little or not all to be desired and chiefly to be apprehended. Therefore, one third of the span of the function is needless fertility, footing up to fifteen years of all but futile vexation. Even with four pregnancies and full nursings, there are still some four hundred periods in which to use ten guards each, or some four thousand nuisances.

Any venture looking to mitigation of menstruation merits unbiased analysis.

For protection against the four or five days of trickle or gush or stain the requirement has been a roll or pad between the thighs, in a cleft so narrow there is no room for it. With this device every step in walking produces some degree of triple-surface rubbing, and every jounce when sitting produces upward pressing. These may be gratuitous discomforts, since, in the absence of the napkin, there is no contact or pressure of the chair seat against the vulva except in unusual conformations, as shown in an unpublished study of mine.

To the external menstrual guard there are some six objections.

To and fro motion may carry contamination from the anal opening to the urinary and vulvovaginal canals, and from the urinary outlet to the vaginal entrance (figures 1 and 6), a process favored by dampness and warmth, to say nothing of surface irritation. In one questionnaire, notice of chafing runs to 14 per cent.[1]

This region, like the armpit, is especially endowed with glands which give forth odor with hampered ventilation, from perspiration and sebaceous secretion, while stale blood, urine and leukorrheal discharge may be factors. Commercial reports show deodorants bought with napkins by one fourth of the purchasers in one series, by nearly half in another [2] and in a third by 59.8 per cent.[3] Recently, napkins carrying a deodorant have appeared in the market. One fourth of certain tampon users praised the freedom from odor.[1]

The support for this surgical dressing calls for some sort of harness or attachment—strap, girdle and buckles—ill adapted to close fitting or diaphanous modern clothing.

Carriage of unnecessary bulk is a bother; disposal after soiling is a trouble, what with the prohibition on blocking drains. The contrast is strikingly shown in figures 5, and between 6 and 7. (Box sizes are as seven to one figured in lots of twelve.)

Lastly, any external menstrual guard, in addition to applying some degre of heat within a confined space, is responsible for rhythmic play of pressure against surfaces uniquely alert to erotic feeling. This may affect a point projecting nearly to the outside and lying in a crevice into which the band may sink—a point which carries more nerve ends closely packed than any like area—namely, the clitoris (fig. 6). The timing of this combination of warmth, friction and pressure fits the peak of congestion of the external genitals for the monthly cycle. Thus an unavoidable focus of attention on the region is emphasized for four days.

The engineering efficiency—or deficiency of the external guard calls for study. This bulk is worn in order to take care of an amount of fluid smaller than is generally appreciated. The total flow averages 2 to 4 ounces (60 to 120 cc.), which is only up to a half cupful.[4] The first day may yield half the total, or a gush may expel retained fluid, or there may be a pause and resumption. Among 30 women only one fourth ran over 3 ounces and one eighth exceeded 4 ounces.[4] Twenty gynecologic textbooks give a much higher average, the range being from 2 to 7 ounces, as compared with those of the researches here summarized—researches which are not yet sufficient or altogether convincing.

The capacity for absorption for the usual commercial article would allow two to four tampons to take up the total output, so that the common employment of ten to twelve, as with napkins—at a cost from 22 to 36 cents—should provide the desirable changes. For the first day, with its possibility of half the total flow, unless the tampon is replaced often or two are worn at the same time, a tenth to a fourth of the women in various reports use a supplementary or substitute external guard. Home made tampons were reported in use by 37 per cent of users in 1942.[3] (This may account for part of the discontinuance.) The common commercial form is a cotton roll compressed to the size of the last two joints of the little finger (figs. 5 and 8), some being slightly tapered. The variety that has far the largest sales runs in three sizes and is provided with a light inserter for placement at any depth by means of a cardboard tube of glazed surface with a cardboard plunger for expulsion of the tampon into the vagina (fig. 8). Four of the six varieties are absorbent cotton, one of cotton linters, one of crape paper held with a net of threads [4a] (fig. 5). All are provided with a waterproofed string for withdrawal. All but one are compressed. They are packaged with individual wrapping of cellophane or paper or in twos or threes. The length, when compressed, is below 2 inches (fig. 5); the diameters run from ½ to 9/16 inch (12-15 mm.). It is to be noted that the posterior vaginal wall averages 3½ inches (9 cm.) in length, while the breadth of the vagina at its upper end, undilated, averages 2½ inches (6 cm.), which is a fact not generally understood. Under ordinary intravaginal pressures the material does not swell as much as in a glass of water. During the process of removal the passage is to be noted as funnel shaped downward. The outlines in figure 5 show tampons compressed and also pulled wide apart to demonstrate differences in construction, but this size is quite beyond their dimensions when saturated within the vagina. As between external and internal guards, the proportional bulk is as fifteen to one.

The living vagina is something of a *terra incognita* as far as slant, shape and dilatability are concerned, and these are all factors bearing on tampon usage. In the dorsal posture the cavity readily holds 10 cc. and, relaxed, 20 to 45 cc., or from ⅓ to 1½ ounces.[5] In the knee chest posture it holds 2 to 3 ounces (60-90

1. Research Bulletin, Womans Home Companion, January 1940.
2. Private study by manufacturers of Meds.
3. Fawcett Publications Market Research Forum, December 1942.

4. Hoppe-Seyler: Ztschr. f. physiol. Chem. **42**: 545, 1904. Driessen: Zentralbl. f. Gynäk. **17**: 618, 1914. Lahile: Ann. d. gynéc. et obst. **72**: 535, 1916-1917. Hermstein: Arch. f. Gynäk., 1927, p. 130. Barer, A. P.; Fowler, W. M., and Balbridge, C. M.: Proc. Soc. Exper. Biol. & Med. **32**: 1458, 1935. Barer, A. P., and Fowler, W. M.: Am. J. Obst. & Gynec. **110**: 790, 1938. Fluhman, C. F.: Menstrual Disorders, Philadelphia, W. B. Saunders, 1939, p. 60. Lewing, A. W.: Personal communication to the author.

4a. Consumers Reports, June 1942, p. 157; October 1943.

5. Rakoff, A. E., and Caspar, S. L.: Technic of Vaginal Medication, Pennsylvania M. J. **46**: 582 (March) 1943.

cc.) but 5 to 10 ounces (145-300 cc.) with its outlet held closed and under pressure (fig. 2). Kolbow[6] found 20 cc. a convenient fill for his 500 x-ray shadows, median and lateral (figs. 2 and 3). The passage, in the

Fig. 1.—Midsection of pelvic contents of women, standing or sitting, with vaginal walls drawn somewhat apart and uterus slightly lifted.

dorsal posture, slopes toward the midsacrum with the tip of the cervix on the level of the ischial spines. In the standing or sitting posture it runs at only a slight

Fig. 2.—Capacity of moderately distended vagina, from the Kolbow x-rays in dorsal posture and the Dickinson averages of 116 cases taken on knee chest posture under atmospheric pressure.

incline, so that the external os lies close to the tip of the coccyx, a situation almost unknown to the pictures in textbooks on anatomy and gynecology, but fully illustrated in my Human Sex Anatomy.[7]

The total channel is most aptly designated by the term vulvovaginal passage. Undistended, the major diameters of the two crevices are set in curious fashion at right angles to each other. The inner aspects of the vulva lie together in the midline of the body; the walls of the empty vagina lie flat crosswise of the body (fig. 3). Only when distended rather fully are the combined passages a continuous tunnel. And this tube exhibits a curve with a moderate hour glass narrowing just within the hymen. Most important is the lateral spread of the passage at its upper end (fig. 3), where it reaches the breadth of 2½ inches (60 mm.) and where such span sometimes permits the retroversion pessary to slip crosswise. The right lateral fornix is usually the deeper and the cervix not in the midline,[8] and the tip of a long tampon slips into the pocket on one side or other of the portio vaginalis, if not behind it.

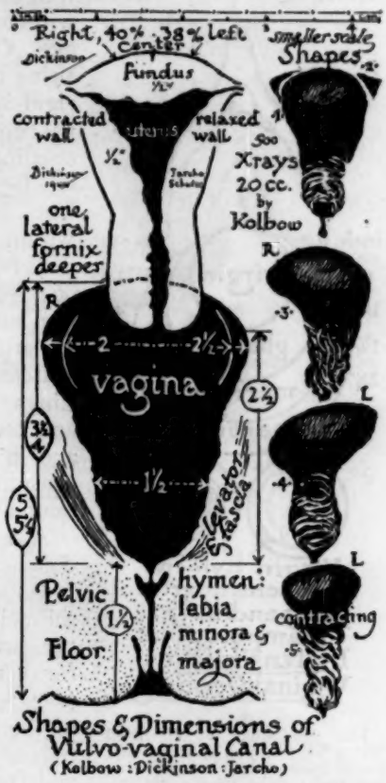

Fig. 3.—Vagina from front to show width at upper end, asymmetry and pelvic floor support for tampon.

An important factor is the sling of muscular and fascial layers that sweep downward and backward along the sides and rear of the passage (figs. 1 and 3), forming a sphincter group which retains the tampon within its upper two thirds. The levator ani is pictured for the most part as made up of fan shaped sloping bands with the inner border skirting the sides of the vaginal and anorectal canals. But attention is being drawn more and more to the large numbers of fibers running into the perineal body and into the lateral and posterior walls of the vagina.[8] Hence a new designation is suggested for the group of four muscles that loop around the vagina, maintaining closure of its outlet. The "vaginal sphincter group" would thus be made up[7] of the outer ovals, the deep and superficial bulbocavernosus muscles, plus the pubococcygeal pair, with clearly palpable, thickened inner edges, plus the ischiococcygeals that furnish the inner flattened plane. Indeed, the female pelvic floor is built as if designed to hold a tampon in place in the erect posture, because the vagina lies nearly level on this floor. With any fluid content it becomes the "bowl" of Kolbow,[6] as shown in figure 2, this lesser bowl being supported on the larger bowl, the pelvic floor.

Here then is a hollow organ with thin walls endowed with very faint, slow rhythms of contraction;[6] with

6. Kolbow, H.: Ztschr. f. Gynäk. **16**: 748, 1941.

7. Dickinson, R. L.: Human Sex Anatomy, Baltimore, Williams & Wilkins Company, 1933.

8. Curtis, A. H.: Surg., Gynec. & Obst. **74**: 708-727, 1942.

sensory fibers of the mucous membrane "meager" in the upper two thirds;[9] so little sensitive "in its deeper portion and farther part of the anterior wall" that one can operate here without anesthesia, the sensory capacity developing "the nearer one approaches to the vestibular orifice."[10] Goodall[11] calls this cervicovaginal district the "great silent area of the pelvis." The vaginal response in coitus belongs to the orifice and to the muscular girdle, as my swab tests show. The erotic stimulus of the stationary interior guard should be, therefore, momentary and negligible as compared with that of the moving pressures of the external pad, on areas provided with remarkably different ratios of sensory nerve endings.

The hymen may, at first touch, be tender like the lining of the eyelid, but it is unlike the conjunctiva in that it can become as tolerant as the mucous lining of the mouth and its lips, what with douching, gentle stretching or good lubrication of the tampon tip, and this without any nick or damage. Only in the hypersensitive or in the rare, thick, rigid form, or the somewhat infrequent substandard opening is stretching needed, begun in the hot bath. The looping muscles just within the hymen (fig. 1) may resist entrance because of a reflex due to apprehension of hurt. There is wide variation here as in all other muscles, for these muscle slings are especially thick and tense in tennis addicts and horsewomen, but any spasm disappears with patient avoidance of urgency.

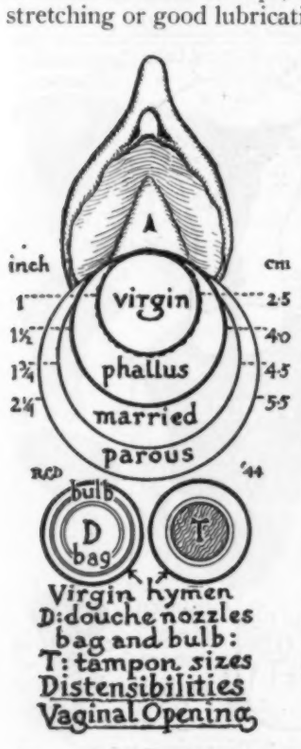

Fig. 4.—Caliber of distended hymen in virginal, married and parous woman, in relation to tampon and douche tube diameters.

A good educator is the douche.

Within the bony walls of the pelvic cavity the organs are provided with capacity for very free displacement, to care for complete filling of the bladder and the rectum and to welcome the to and fro movement of a 6½ inch phallus of a diameter of 1½ inches. Thus room for one or two tampons falls well inside the shifts to which uterus and vaginal walls are keyed.

Concerning the diameters and dilatability of the hymen there has been little published. My long series when pioneer calibrator[7] shows that most unentered hymens admit the average lubricated examining male forefinger for two joints, or the female index entire, the circle having a median diameter of an inch (2.5 cm.) (fig. 4). With the childless married woman two male forefingers pass fully (1½ inches, 4 cm.), which is the peak of the graph of the diameters of the erect penis in the Grien series of 486 white adults[12] and fits the 1,000 of the Kinsey series.[13] Thus the tampon has a caliber that does not impair standard anatomic virginity (figs. 4 and 5).

Unrepaired injuries of labor and sagging vaginal walls may fail to provide support for the tampon. Cervicitis,[14] frequent in the genuine virgin,[14a] or tender uterosacral ligaments, or a sensitive bladder base, or the habitually loaded rectum may exclude tampon usage.

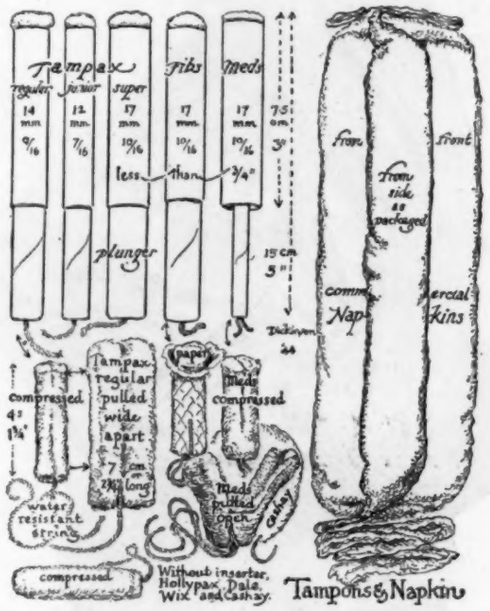

Fig. 5.—Tampons of various makes.

Sales of tampons run to about 10 per cent of sales of commercial napkins. The commercial reports on increase in demand is clinical evidence of value. A continuous survey of 749 drug stores finds the increase all over the country,[15] with 1943 sales five times those of 1937. A

Fig. 6.—External menstrual guard in place to contrast for bulk and simplicity with the tampon in figure 8.

9. Piersol: Anatomy, 1918, p. 2018.
10. Poirier and Charpy: Anatomie, 1907, p. 572 (Rieffel).
11. Goodall, J. R.: Puerperal Infection, Montreal, 1932, p. 75.
12. Grien, S. K.: Research about to be published.
13. Kinsey, Alfred C.: Personal communication to the author.
14. Macfarlane, Catharine; Sturgic, Margaret C., and Fetterman, Faith S.: The Value of Periodic Pelvic Examination in the Control of Cancer of the Uterus, J. A. M. A. **126**: 877 (Dec. 2) 1944.
14a. Brunet, W. M.: M. Rec. **151**: 384, 1940 (913 premaritals, 177 cervicitis with intact hymen).
15. A. C. Nielson & Co., Chicago.

study of 1,674 women made in 1940 found one fourth using tampons, though but few depended on them exclusively, while of the total questioned a fifth had made no trial and a seventh discontinued them.[1] A 1944 survey in twenty-six cities covered interviews with 2,500 women purchasing the two kinds of menstrual protectives.[2] Of these, 24 per cent used tampons, including the third with exclusive dependence, and the two thirds with supplement of a napkin part of the time. Such use was equally distributed between married and single women, the higher the income bracket the greater being the employment of the tampon. The peak of exclusive use was between 20 and 24. Availability of the tampon as guard was known to 94 per cent of those seen, but nearly one third were too apprehensive to make a trial, and inertia and satisfaction with the napkin accounted for 43 per cent of nonusers. Among the 300 who stopped, discontinuance had been due to discomfort in one fifth, to defective protection in another fifth and

Fig. 7.—Tampon in place filled with absorbed flow.

to dislike in one sixth. Recommendation by friends started a third; advice by a doctor was the reason for beginning on the part of 34 out of 900 women, while 11 were stopped in such use by their physicians.

The 1941 research of Karnaky[16] on 2,000 women, covering use for a year or more, included 40 who tested its tolerance by wear day and night. They replaced the tampon twice a day and were examined every two to four weeks for vaginal p_H and for glycogen and had cultures for bacterial growth, with biopsies and also a recording of the visual finding. Karnaky made the sweeping claim that the normals stayed normal, the abnormals became normal, and changes in biopsy and vaginal smear were not found. Also that in 6 patients with profuse bleeding he had packed the vagina snugly during one to six days before opening the abdomen, yet he discovered no evidence of backing up into the peritoneal cavity. Among 110 nurses testing tampon use, he reported 95 per cent satisfied with control all through the period. Sackren[17] reports 90 per cent of users completely protected. Magid and Geiger[18] in 25 women found no alteration in p_H, glycogen or flow and with complete absorption wherever the size of the tampon was correlated with the length and caliber of the

Fig. 8.—Inserter passed into vagina before plunger extrudes tampon; below, average dimensions compressed for introduction.

vagina. Meigs[19] reports tolerance in trichomonas treatments. Barton[20] had 30 patients using tampons four to five years without irritation or inflammation, but with

Fig. 9.—Tampon placed too near surface absorbs urine.

virgins showing partial or total "rupture" of the hymen, and found that blood acquired odor only after leaving

16. Karnaky, K. J.: M. Rec. & Ann., May 1941.
17. Sackren, H. S.: Clin. Med. & Surg. **46**: 327, 1939.
18. Magid, M. O., and Geiger, J.: M. Rec. **155**: 316, 1942.
19. Meigs, J. W.: New England J. Med. **226**: 562, 1942.
20. Barton, M.: Brit. M. J. **1**: 524 (April 25) 1942.

the vagina. In 6 women in another series, exact tests devised for odor determined a mean increase with napkin over tampon of 3½ times, the range being 1½ to 7 times.[21]

Thornton [22] found 103 of 110 women preferring tampons through all or part of the period and after a twenty-four month study found 50 of the 110 women (45.5 per cent) showing no change in pelvic condition. Of 51 subjects showing cervical erosion at the initial examination, 14 showed no cervical erosion at the final examination. There was no increase in severity in any case nor did cervical erosion develop in a subject who did not have the lesions at the initial examination. Bessie Moses,[23] lecturer in three women's colleges, finds a large percentage using tampons and without ill effects or (with intact hymens) without irritation or cervicitis on examination.

Diddle and Boulware [24] studied 569 college students, with 80 per cent reporting comfort, 17 per cent complaining of pressure on the bladder or difficulty in defecation, with cramps increased and leukorrhea caused in a small number. One third discontinued because of failure of control or discomfort, but there were no untoward sequels. Thwing,[25] in free use in a large school because of the desire not to interrupt swimming, declares that she found no complaints. In a 1940 series [1] 1,700 answers gave 26 per cent using tampons. Of these, 63 per cent were commercial and 65 per cent purchased were Tampax. One third reported the need of supplement by napkin. The reasons given by those discontinuing were 40 per cent for discomfort and 25 per cent insufficient protection, while among the 650 women only 1 developed cramps.

Antagonism to tampons presents a curious reversal on the part of gynecologists. The tampon used to pay the office rent. For the most common pelvic ailment,[9] this glycerin or ichthammol carrier supplemented the old iodine swab to the raw cervix twice a week, month after month, until displaced by my electric wire cautery and its modifications, with only one or two applications,[24] used in the office. An authority on vaginitis (Kleegman) has seen 5 instances with the tampon lost days or weeks, because, in placing a second, the presence of the first was forgotten. The odor was strong, the douche ineffective, the raw surfaces healed promptly. (A tampon packed in the far fornix may be reached by the patient in squatting and bearing down. Using two at a time their strings should be tied together).

Arnold and Hagele [26] found 87 of 95 women calling the tampon inadequate for the earliest day or days. Genell and Lysander [27] saw 3 instances of severe vaginitis, with vulvitis, follow tampon use, 2 of them as of a single period. This report at a meeting of the Danish Obstetric and Gynecologic Society brought out several cases of salpingitis and 1 of pelvic peritonitis credited to the device. The report fails to give previous histories or pathology, or length of uninterrupted wearing of the tampon. In this country Singleton has argued most strongly against the principle of intravaginal protection and has been at pains to draw on several sources. His questionnaire to 3,400 diplomates in our specialty and to 500 general practitioners brought singularly few replies, only 211 being usable. These showed 74 per cent opposed, 13 per cent favorable to limited use and 13 per cent giving endorsement. In attempting to summarize his returns from six sources one seems to find 641 women who had made trial of the tampon, with acceptance by about one third and with the main part of the approval from college women and nurses. Karnaky reports returns from 42 physicians concerning 2,780 tampon users with these results: vaginitis 1 in 33, cervicitis 1 to 100, dysmenorrhea made worse 1 to 112, salpingitis 1 to 123 and possible endometriosis 1 to 932.

Widenius [28] describes the six varieties of tampons. Frontal x-rays show size and location at placement and after a short stay in the vagina (but not with fullest possible saturation). Menstrual flow is to be studied for quantity by weighing tampons. A 2 inch length is recommended as less likely to deflect the cervix. She finds in tampons "safety, comfort and complete protection," with no unfavorable effect.

COMMENT

Among more than 6,500 women reporting on menstrual tampons as recorded in nineteen sources in the literature, medical and commercial, there are series that voice satisfaction ranging around the 90 per cents, especially with younger women, educated groups and better incomes. This includes much reliance on interior protection alone, but with some supplement by the external guard at the beginning of the period. One fifteenth of the bulk of material thus suffices to absorb the average flow of 2 to 4 ounces and avoids the harness and chafing and also minimizes odor. In another group of reports there is acceptance by one fourth to one third, discard being based on discomfort in about the same proportion, and on incompleteness of first day protection in about one fourth. Cramps and inflammation appear in under 1 per cent of users; apprehension about damming back through the uterus finds scant support; salpingitis and serious complications are rare, appearing in two American and one foreign report. A questionnaire to 4,000 physicians brought notably few answers, with a fourth of those endorsing use or limited use.

The physician asked by the patient about tampons can answer that healthy women with average flow are using them increasingly with comfort but may need the outer guard the first day also; second, that doctors lack reports on a series of local examinations on those who reject them after trial, to discover the reasons, and, third, that in her own case her local examination will show, or has shown, absence of any undue tenderness, inflammation, cramp or lack of room which would defer or prevent use of the tampon.

Relations between the anatomy in the living and tampon size and placement are fully presented, with the need shown for new figures on average flow and of much more analysis of pelvic findings before and after wearing tampons throughout the menstrual flow.

2 East 103d Street.

21. Applied Research Laboratories, Dayton, N. J., June 1939.
22. Thornton, M. G.: Am. J. Obst. & Gynec. **46**: 259-265, 1943.
23. Moses, Bessie L.: Personal communication to the author.
24. Diddle, A. W., and Boulware, L.: J. Iowa M. Soc. **32**: 256 (June) 1942.
25. Thwing, G.: J. Health & Phys. Ed., March 1943.
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27. Genell, S., and Lysander, A.: Svenska läk.-tidning. **36**: 2236-2240 (Dec. 8) 1939.
28. Widenius, Elizabeth F.: Am. J. Obst. & Gynec. **48**: 510-522, 1944 (under supervision of B. D. Watson).

A STUDY OF HEPATIC FUNCTION IN THERAPEUTIC MALARIA

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AND
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MINNEAPOLIS

An evaluation of hepatic function in 31 patients given therapeutic malaria was undertaken in this investigation. Lichtman [1] states that, although liver injuries developing in the course of tropical malaria are well known, little is known about the pathologic changes of the liver in inoculation malaria. He cites Materna's [2] 6 patients with dementia paralytica, given malarial therapy, in whom the main microscopic changes in the liver were extensive necrosis. Dattner [3] states that the occasional icterus he has observed in therapeutic malaria patients is usually of the hemolytic type and rarely indicates damage to the liver parenchyma. He adds however that, if the icterus is accompanied by severe anorexia and vomiting, quinine must be given to the patient. Moore [4] states that a mild jaundice occurs in about half of the patients treated and that it need not be feared. He, too, attributes the jaundice largely to the rapid destruction of red blood cells. However, he observed 3 or 4 cases of toxic hepatitis with deep and increasing jaundice accompanied by hepatomegaly, directly resulting from malaria.

On the other hand, O'Leary, Greene and Rowntree [5] as early as 1929 believed that the jaundice associated with inoculation malaria was not entirely due to destruction of blood but should be classified as a hemohepatogenous type of icterus. Kopp and Solomon [6] in 1943 reported transient impairment of hepatic function, evidenced by abnormal liver function tests, in 9 patients given malarial therapy for dementia paralytica. They observed occasional jaundice following the administration of a few injections of an arsenical after the malaria fevers had been stopped. They pointed out possible danger in overburdening the liver with combined malarial and arsenical therapy.

Mirsky, Brecht and Williams [7] recently reported laboratory evidence of hepatic damage in 10 cases of natural malaria.

The postmalarial death of a 46 year old woman at the University of Minnesota Hospitals, Sept. 1, 1943, sharply focused our attention on the scant evaluation of hepatic function in therapeutic malaria. Postmortem examination of this patient showed acute degeneration of the liver and portal cirrhosis. A more thorough study of hepatic function was therefore started on subsequent patients.

MATERIAL

Twenty-nine adult patients were given malarial fevers in the dermatosyphilology service of the University of Minnesota Hospitals between July 1, 1943 and May 1, 1944. Two adult patients similarly treated in the neuropsychiatric service between Jan. 1 and May 1, 1944 were followed and added to the series of cases studied. Twenty-one were men and 10 were women. The median age of the group was 41 years. The oldest patient was 62, the youngest 28. Benign tertian malaria was inoculated intravenously in all except 2 patients, who were inoculated intramuscularly. The diagnoses were as follows: All 31 cases were acquired neurosyphilis, 12 asymptomatic, 2 late diffuse meningovascular, 7 active tabes dorsalis, 3 early dementia paralytica with tabes and 7 dementia paralytica. No manifest liver disease was noted prior to malarial therapy. All patients were considered good clinical risks for malaria.

It is fully realized that adequacy of malarial therapy in the treatment of neurosyphilis is an individual problem and that the severity of the disease process and the reaction of the patient to the treatment are factors to be considered in a classification of complete or near complete therapy. However, for the purpose of the investigation it was considered necessary to make an arbitrary classification for a comparative study.

TABLE 1.—*Treatment of General and Special Diet Patients*

	Reason
General diet group	
Therapy complete (14 cases)	
Therapy near complete (6 cases)	
Case 1	Spontaneous termination of fevers
Case 6	Pronounced weakness, age of patient
Case 9	Pronounced hepatomegaly and spider nevi
Case 16	Pronounced anemia (hemoglobin 7 Gm.)
Case 19	Urgency of personal business
Case 24	Pronounced leukopenia (leukocytes 1,950)
Therapy incomplete (5 cases)	
Case 7	Pronounced fatigue and lethargy, pronounced hepatomegaly, spider nevi
Case 15	Pronounced fatigue, moderate hepatomegaly
Case 18	Urgency of domestic problem
Case 20	Severe, persistent nausea and vomiting, pronounced weakness, spider nevi
Case 28	Spontaneous termination of fevers
Special diet group	
Therapy complete (1 case)	
Case 31	
Therapy near complete (3 cases)	
Case 21	Spontaneous termination of fevers
Case 23	Pronounced fatigue
Case 25	Spontaneous termination of fevers
Therapy incomplete (2 cases)	
Case 27	Pronounced fall in blood pressure during fevers
Case 29	Pronounced anemia (hemoglobin 6.9 Gm.)

The criterion for a complete course of therapy was considered to be either forty hours of fever at 103 F. or 150 hours of fever at 100 F. (oral temperature). Eight to ten malarial fevers were usually given. Malarial therapy of patients receiving either thirty-five hours of fever at 103 F. or one hundred and thirty-five hours of fever at 100 F. was classified near complete.

The 31 patients included in the investigation were divided into two groups. The first 20 were given general diets. Because of the consistent hepatic disturbance observed, the use of liver sparing diets (high carbohydrate, high protein and low fat) was added to the study. The last 11 patients were given, alternately, the special or the general hospital diet.

Table 1 shows the amount of therapy given to the general and special diet patients. Reasons for premature termination of fevers are listed.

From the Division of Dermatology and Syphilology, Department of Medicine (Dr. Fredricks) and the Division of Internal Medicine, Department of Medicine, University of Minnesota Hospitals.

Read before the Section on Experimental Medicine and Therapeutics at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 14, 1944.

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OBSERVATIONS AND METHODS

The clinical features observed especially were (1) weight loss sustained, (2) symptoms and signs of gastrointestinal disturbance such as anorexia, nausea and vomiting and (3) degree of weakness ensuing. Other clinical findings of interest were recorded. The hepatic disturbance resulting was evaluated by (1) the quantitative serum bilirubin test, (2) the cephalin cholesterol flocculation test, (3) the twenty-four hour amount of urobilinogen in the urine and the two hour quantitative urine Ehrlich reaction and (4) the sulfobromophthalein dye retention test.

The level of serum bilirubin was determined by a slight modification [8] of the Malloy-Evelyn technic [9] that permits determination of the prompt direct reacting bilirubin (one minute reading), the delayed direct (fifteen minute reading) and the total bilirubin (reading after alcohol addition). Normal values of the one minute reading range are below 0.2 mg. per hundred cubic centimeters; normal total values are below 1.0 mg. per hundred cubic centimeters.[9a]

The urinary excretion of urobilinogen in the twenty-four hour sample was determined by the quantitative method of Watson.[10] The normal range by this method is 0 to 3.5 mg. in twenty-four hours. A simplified method was later employed.[11] It permits colorimetry of the Ehrlich reaction in a given urine sample. This method, although not precise as far as urobilinogen is concerned, has been found to yield information of approximately the same significance as the twenty-four hour method. The color intensity of the Ehrlich reaction is designated in terms of Ehrlich units, 1 unit indicating the amount of color produced by 1 mg. of crystalline urobilinogen. Amounts in excess of 1 unit in the 2 to 4 p. m. urine sample were regarded as indicating impaired liver function.

The cephalin-cholesterol flocculation test was carried out according to the technic of Hanger.[12] Cephalin, supplied by the Difco Company of Detroit, was used. Readings were made at the end of twenty-four and forty-eight hours. As a control, known positive and normal serums were tested concomitantly with the unknown serums.

The sulfobromophthalein test was performed using 2 mg. of the dye per kilogram of body weight and the blood sample secured at twenty minutes. Mateer, Baltz, Marion and MacMillan [13] in their control studies found no retention of the dye at this time in normal subjects.

TABLE 2.—*Clinical and Laboratory Data*

Case	Age	Sex	Therapy †	Weight Loss, Pounds	Weakness Severe	Gastrointestinal Disturbances Severe	Other	C. C. (b)	C. C. (d or a)	Bilirubin, Mg. per 100 Cc. P. D.	Bilirubin, Mg. per 100 Cc. T. (b)	Bilirubin, Mg. per 100 Cc. P. D.	Bilirubin, Mg. per 100 Cc. T. (d or a)	Urobilinogen, Mg. per 24 Hr. (b)	Urobilinogen, Mg. per 24 Hr. (d or a)	Ehrlich Units per 2 Hr. (b)	Ehrlich Units per 2 Hr. (d or a)	Sulfobromophthalein, % Retention (b)	Sulfobromophthalein, % Retention (d or a)
1	47	♀	N	9	Yes	No	.....	...	...	0.2	0.8	0.9	1.8						
2	41	♂	C	12	No	Yes	.....	...	...	0.2	0.8	0.1	1.2						
3	42	♂	C	9	No	No	.....	...	...	0.0	0.5	0.3	1.1						
4	49	♀	C	16	Yes	No	.....	0	2+	0.2	0.5	0.5	1.5						
5	36	♂	C	..	No	No	Jaundice, hepatomegaly, purpura	...	4+	0.2	1.1	1.1	2.8	...	28.7				
6	52	♂	N	10	Yes	No	.....	0	2+	0.2	1.0	0.2	0.9						
7	36	♀	I	12	Yes	Yes	Spider nevi hepatomegaly	...	4+	0.4	1.4	0.4	1.7	1.1	42.4				
8	56	♂	C	..	Yes	No	.....	...	2+	...	...	0.4	0.9						
9	30	♂	N	..	No	No	Spider nevi hepatomegaly	0	2+	0.3	1.0	0.8	1.7	...	72.5				
10	28	♂	C	10½	No	No	.....	1+	4+	0.0	0.4	0.1	0.5	2.2	12.8				
11	28	♂	C	11	No	No	.....	Dbt.	4+	0.1	0.4	0.1	0.9	1.6	17.4				
12	45	♂	C	..	Yes	No	.....	Dbt?	4+	0.2	1.0	0.4	1.3	...	3.4				
13	38	♀	C	11	No	Yes	Spider nevi	1+	4+	0.2	0.5	0.2	1.3	0.8	37.3				
14	49	♂	C	..	No	No	.....	...	3+	0.2	0.8	0.3	0.5	...	143.9				
15	41	♂	I	18	Yes	No	Hepatomegaly	0	4+	...	...	0.2	1.0	0.3	95.4				
16	35	♀	N	8	No	No	.....	0	4+	0.1	0.9	0.8	2.6	0.7	168.3				
17	39	♂	C	18½	Yes	Yes	.....	0	3+	0.1	0.7	1.5	4.0	7.6	133.0				
18	42	♂	I	13	No	No	.....	0	4+	0.6	1.0	0.6	2.8	1.6	13.3				
19	35	♂	N	..	No	No	.....	1+	4+	0.3	0.6	0.2	1.4						
20	37	♀	I	..	Yes	Yes	Spider nevi	1+	4+	0.1	0.5	0.3	1.5	0.5	24.3				
21*	43	♂	N	1	No	No	.....	1+	3+	0.1	0.3	0.2	1.2	...	....	5.2	2.1	5.0	4.5
22	55	♂	C	6	No	Yes	.....	0	4+	0.1	0.4	0.3	1.0	...	....	0.4	6.3	...	18.0
23*	49	♂	N	4½	Yes	No	.....	2+	4+	0.1	0.8	0.6	1.7	...	....	1.1	21.3	0.0	12.0
24	33	♀	N	..	No	No	.....	1+	2+	0.1	0.4	0.1	0.4	...	....	0.5	16.0	7.5	
25*	45	♀	N	2	No	No	.....	2+	4+	0.1	0.3	0.2	1.6	...	....	2.5	2.8	3.5	
26	33	♂	C	6½	No	No	.....	2+	4+	0.1	0.8	0.3	1.7	...	....	1.5	13.7	7.5	12.5
27*	42	♀	I	3½	No	Yes	Increased number of spider nevi	3+	4+	0.0	0.4	1.0	2.1	...	....	1.0	16.2	7.5	2.5
28	54	♂	I	6	No	No	.....	1+	4+	0.2	0.6	0.3	1.0	...	....	0.7	2.1	10.0	5.0
29*	31	♀	I	4	Yes	Yes	.....	2+	4+	0.1	1.2	0.3	0.8	...	....	0.1	5.6	1.3	32.5
30*	62	♂	C	9½	Yes	Yes	.....	0	4+	0.3	0.6	0.3	0.9	...	....	0.6	4.0	2.0	16.3
31*	36	♂	C	4½	No	No	.....	Dbt.	3+	0.2	0.6	0.2	0.6	...	....	0.3	2.3	0.0	12.5

* Special diet.
† Therapy: C, complete; N, near complete; I, incomplete.
b= before malarial therapy, d or a = during or immediately after malarial therapy.
C. C. = cephalin-cholesterol flocculation, readings at 48 hours.
P. D. = prompt direct reacting bilirubin, readings at 1 minute.
T. = total bilirubin, readings after addition of alcohol.

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RESULTS

The clinical data of the 31 patients studied are listed in table 2.

Data of weight loss before and immediately after malarial therapy was obtained in 23 patients, and the average loss was 9 pounds (4 Kg.). Of these patients 17 received general diets and averaged a loss of 10.9 pounds (highest 18½ and lowest 6 pounds) and 6 were given special diets and averaged a loss of 3.3 pounds (highest 4½, lowest 1). Thirteen of the 17 general diet patients received complete or near complete therapy and averaged a loss of 10.4 pounds (4.7 Kg.). Four of the 6 special diet patients were given complete or near complete therapy and averaged a loss of 3 pounds (1.3 Kg.). A comparison of the malarial courses given the general and special diet patients receiving complete or near complete therapy is justified by the fact that the former averaged 9.6 fevers, 42.8 hours of 103 F. and 136.2 hours of 100 F., whereas the latter averaged 9.3 fevers, 40.0 hours 103 F. and 133.5 hours 100 F. (all oral temperature).

The degree of weakness was recorded as severe or not significant. In 5 instances (cases 6, 7, 15, 20 and 23) the extreme weakness, actually prostration, was a major factor in the decision to terminate the malarial therapy prematurely. Ten of 25 general diet patients were severely weakened from malarial therapy, whereas only 1 of the special diet group experienced this degree of weakness.

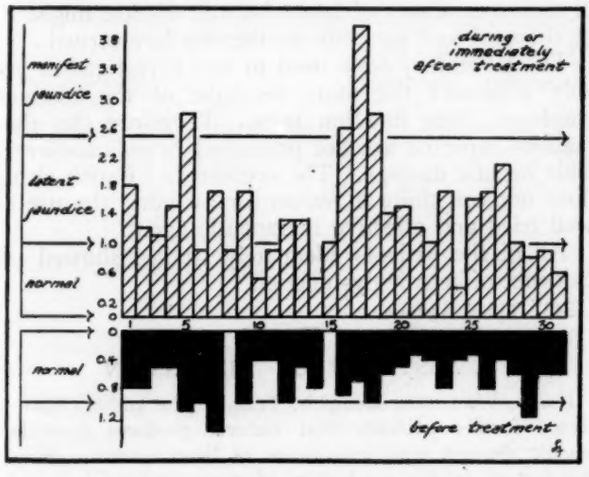

Chart 1.—Quantitative serum bilirubin test reported in milligrams per hundred cubic centimeters; reading at fifteen minutes after addition of Van den Bergh reagent (includes prompt direct and delayed direct reacting pigment); 31 patients.

The gastrointestinal disturbances observed were also considered either severe or not significant. Anorexia invariably developed during malarial fevers. Vomiting frequently followed. These disturbances varied from mild to severe, and in 1 instance (case 20) nausea and vomiting continued four days after termination of the malarial therapy. Seven of 25 general diet patients and 2 of 6 special diet patients had severe gastrointestinal disturbances.

Other clinical findings of interest deserve mention. Purpura, scleral icterus and moderate enlargement of the liver developed in case 5 after eight fevers. Spider nevi developed in cases 7, 9, 13 and 20 after ten fevers. Hepatomegaly during malarial therapy developed in cases 7, 9 and 15. A few spider nevi were noted in case 27 prior to malarial therapy, and other similar nevi developed during the course of her fevers.

The results of the four liver function tests used are depicted in charts 1, 2, 3 and 4 and table 2.

Quantitative serum bilirubin determinations were performed on all 31 patients (chart 1 and table 2). Two patients did not have bilirubin tests before malarial therapy. Twenty-four of the 29 patients studied adequately showed an increase in total bilirubin during the malarial fevers. Elevations to 1.7 mg. per hundred cubic centimeters or more of total bilirubin and 0.6 mg. per hundred cubic centimeters or more of prompt direct reacting bilirubin were considered significant and were observed in 8 cases (1, 5, 9, 16, 17, 18, 23 and 27). Six were general diet patients and 2 were on the special diet.

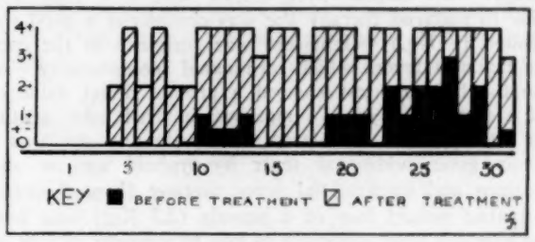

Chart 2.—Cephalin cholesterol test reported in degree of flocculation, reading at forty-eight hours; 28 patients.

The influence of malarial therapy on cephalin-cholesterol flocculation is demonstrated by chart 2. The specific data are included in table 2. Eighteen general diet patients and 6 special diet patients developed significant and comparable increases in flocculation. Four general diet patients, not tested prior to therapy, had significant flocculation following their fevers.

Chart 3 shows the urinary excretion of urobilinogen in 24 malarial patients. Thirteen general diet patients were tested by the twenty-four hour method, and significant increases of urobilinogen were noted in 9. The remaining 4 were not tested prior to malarial therapy, but 3 showed excessive excretion of urobilinogen in the course of their treatment. Eleven cases, 5 general diet patients and 6 special diet patients, were tested by the two hour method. Nine of the 11 showed significant increases in urobilinogen excretion. There was no appreciable difference between the general and special diet groups.

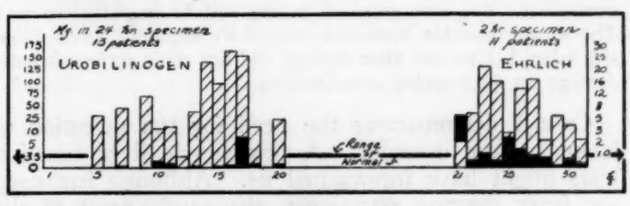

Chart 3.—Twenty-four hour urine urobilinogen excretion and two hour urine Ehrlich values. The data on the right represent Ehrlich units in the 2 to 4 p. m. urine samples. Black areas are observations before malarial fever began.

Chart 4 shows the percentage of sulfobromophthalein retention in 11 patients. Eight were tested before as well as during or immediately after therapy. Five of the 8 showed significant increases. However, in 3 patients the dye retention decreased in the course of their therapy. Again there was no appreciable difference between the general and special diet groups.

COMMENT

Two patients were considered worthy of special mention. Their pertinent histories and findings are given:

Case 1.—A white woman aged 47, diagnosed as having dementia paralytica, was a chronic alcoholic addict of many years' standing. She was diagnosed as having meningovascular neurosyphilis in 1936 but refused to take antisyphilitic chemotherapy. No clinical liver disease had ever been apparent. Prior to malarial therapy she was considered a good risk. A 9 pound (4 Kg.) weight loss was sustained in the course of nine malarial fevers which terminated spontaneously. At that time the bilirubin test showed a prompt direct value of 0.94 and a total value of 1.76 mg. per hundred cubic centimeters. Her therapy was considered inadequate and she was subsequently given additional fever by typhoid vaccine on three occasions and by artificial fever therapy (hypertherm) twice. A further weight loss of 6 pounds (2.7 Kg.) was sustained. The bilirubin level continued to rise to a height of 1.29 mg. per hundred cubic centimeters prompt direct and a 2.31 total. During her immediate convalescence she stated that she felt the best she had in many years. Forty-three days after malarial therapy jaundice was noted and progressively deepened. The bilirubin, urobilinogen and cephalin-cholesterol tests became very strongly positive. The patient died in hepatic coma fifty-eight days after malarial therapy. Autopsy revealed portal cirrhosis and large areas of acute necrosis.

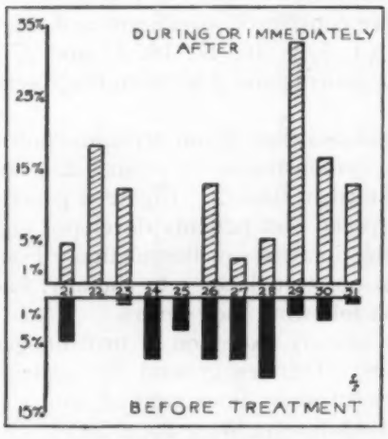

Chart 4.—Sulfobromophthalein retention; readings made twenty minutes after injection of a 2 mg. per kilogram of body weight dose; 11 patients.

Case 30.—A white man aged 62 was diagnosed as having dementia paralytica. No liver disease was apparent from his past history and clinical findings. He had received fifty to one hundred arsenical injections ten to fifteen years earlier. Prior to malarial therapy the results of the four liver function tests were considered within normal limits. In spite of pure tertian fevers following intramuscular inoculation, considerable weakness, severe anorexia and vomiting developed. A weight loss of 3½ pounds (1.5 Kg.) was sustained. The cephalin-cholesterol test became strongly positive. Quinine was given after nine fevers. During his immediate convalescence weakness and anorexia persisted. A further weight loss of 6 pounds (2.7 Kg.) followed. Urobilinogen excretion was excessive, and 16.3 per cent of the dye was retained in the sulfobromophthalein test. The serum bilirubin remained normal throughout. Liver biopsies taken before and after therapy did not show serious hepatic damage on microscopic examination.

Case 1 demonstrates the need for the detection of latent hepatic disorder. A few simple liver function tests might have forewarned us. Although her need for fever therapy was great, the employment of the liver function tests later used or the more adequate appreciation of the bilirubin values observed would possibly have contraindicated the supplementary fevers given her by typhoid vaccine and the hypertherm. Case 30 illustrates a correlation between clinical findings and liver function tests. However, the liver biopsy after malarial therapy did not show serious liver damage.

It was not possible to correlate consistently the degree of weakness and the severity of the gastrointestinal disturbances with the results of the liver function tests. However, the appearance of jaundice in 1 patient, hepatomegaly in 4 patients and spider nevi in 5 patients correlated strikingly with the hepatic disturbance shown by the liver function tests.

The average weight loss during and immediately after malarial therapy in patients given general diets was very striking. That weight loss could be diminished by special dietary measures was clearly demonstrated. Yet in no case was weight loss prevented. The dietary goal sought for the special diet group of patients was 2,500 calories per day, with 400 Gm. of carbohydrate, 150 Gm. of protein and not more than 35 Gm. of fat. Further study of high carbohydrate, high protein and low fat diets is needed in malarial therapy.

SUMMARY AND CONCLUSIONS

The anorexia and other gastrointestinal disturbances in malarial therapy, if ignored, result in a low caloric intake and a striking weight loss.

More attention should be given to the study and use of protective diets in therapeutic malaria.

Malarial therapy is admittedly contraindicated in the presence of clinically manifest hepatic disease (as, for example, cirrhosis).

It would seem advisable to employ a few simple liver function tests in the selection of patients for this type of therapy. Cases of latent hepatic disease might thus be detected and the clinician thereby forewarned.

The laboratory tests used in this investigation probably represent the more sensitive of the commonly employed liver function tests. Therefore the abnormalities reported are not presumed to indicate irreversible hepatic damage. The occurrence of such changes does not constitute a reason for avoiding the use of a well tried and effective therapeutic agent.

All of the patients adequately studied showed some evidence of hepatic dysfunction.

2437 Third Avenue.

ABSTRACT OF DISCUSSION

Dr. L. W. Diggs, Memphis, Tenn.: The authors have presented further evidence that malaria produces parenchymal hepatic changes with impairment of liver function. Some of the factors in the production of these changes are anemia, deposition of pigment and nutritional deficiencies. The high fevers are also to be considered, for similar changes are observed in artificial fevers. In selecting patients suitable for malaria therapy and for drug testing the more sensitive tests, as the cephalin-cholesterol and twenty minute sulfobromophthalein, are preferred. Since most patients during malarial fevers give positive findings with these tests, they are not of equal value during the febrile period. The icterus index and urinary tests for urobilinogen and bile would be of greater value. The test of the direct van den Bergh reaction of the blood is not necessary, for bilirubin is demonstrable in the urine by the simple foam test when there is regurgitative jaundice. Since malaria produces changes in the blood, it is advised to do the following blood studies on patients receiving malaria therapy: (1) white blood cell count to detect leukopenia, (2) hemoglobin to measure anemia and (3) blood smear to detect hemolytic reaction, neutrophilic shift and degenerative changes, number and types of parasites and number of platelets. Less than 1 platelet per oil immersion field is indicative of thrombocytopenia and may be associated with hemorrhages. I have studied the prothrombin concentration by Quick's method at weekly intervals in 59 patients and have not observed significant decreases during the febrile period. The prothrombin test is therefore of little value as a liver function test either in selecting patients for therapy or in guiding therapy and drug administration. Because the clinical and pathologic changes in terminal malaria are similar to those observed in shock, it is essential that ample supplies of whole blood and plasma be available in

order to prevent death. The giving of arsenicals and heat cabinet therapy following malaria is dangerous and should be used only when there is minimal liver damage as revealed by tests for liver function.

DR. M. G. FREDRICKS, Minneapolis: The main conclusion of the investigation is that there was objective evidence of hepatic disturbance in all therapeutic malaria patients studied with liver function tests.

THE CHEST X-RAY EXAMINATION

AN ANALYSIS OF DISQUALIFYING CONDITIONS FOUND AMONG 105,141 SELECTEES

MAJOR RICHARD E. KINZER
MEDICAL CORPS, ARMY OF THE UNITED STATES

The ultimate effects of the induction into the armed forces of the United States of men suffering from an incipient or a frank form of pulmonary tuberculosis is obvious to medical men as well as to the layman. In addition to the health aspect of this problem as we are affected by it in this national emergency we must take practical cognizance of the economic loss to the national government. Spillman [1] estimated in 1940 that the cost to the government of a case of tuberculosis in a veteran of the first world war was between $7,500 and $10,000 to date and that within the next five years the total cost of service connected disability payments would reach the total sum of nearly a billion dollars. Thus it would seem that from the economic as well as from the health standpoint any program designed for the primary purpose of excluding tuberculous risks from the armed forces would be invaluable.

TABLE 1.—*Analysis of 999 Cases of Pulmonary Tuberculosis Discovered During the Chest X-Ray Examination of 105,141 Selectees*

Tuberculosis, pulmonary		Per Cent of Total Rejectees	Per Cent of Total Rejected for Tuberculosis
Reinfection			
Far advanced	15		
Moderately advanced	66		
Minimal	526		
	607	45.7	60.7
Primary infection			
Primary complex, active	7		
Primary complex, healed but excessive	264		
Miliary calcification, healed	24		
	295	22.2	29.5
Pleural			
Pleurisy, recent	12		
Pleurisy, residual, excessive	73		
	85	4.4	8.5
Under treatment			
a. Therapeutic pneumothorax	4		
b. Thoracoplasty	8		
	12	0.9	1.2
Total	999	75.2	100.0

But let us recognize that this is only part of the benefits derived from such a program. The preinduction roentgenologic screening adapted by the United States Army has offered innumerable advantages to the roentgenologist in identifying other disqualifying defects of a nontuberculous nature as well. In addition, this program of routine preinduction chest x-rays parallels similar work being done by the various public health agencies in this country and offers to these agencies the results of this massive survey.

In the fall of 1940, when the Selective Service System began functioning, the urgent need for routine chest x-rays at the induction stations became apparent. It was impossible for the armed forces to assemble enough equipment to undertake such a task on short notice. In some localities the public health departments offered their facilities and began taking routine chest x-rays as early as November 1940.[2] By midsummer of 1941 adequate x-ray facilities were at hand, and since that time millions of preinductees have had routine chest x-ray studies.

TABLE 2.—*Analysis of Nontuberculous Causes for Rejection Found During the Chest X-Ray Examination of 105,141 Selectees*

		Per Cent of Total Rejectees
Thoracic Cage and Diaphragm		
Cystic degeneration, ribs and upper dorsal vertebrae	1	
Spina bifida occulta	9	
Hemivertebra	1	
Sprengel's deformity	6	
Cleidocranial dysostosis	1	
Eventration of diaphragm	9	
Hernia, diaphragmatic	3	
	30	2.2
Heart and Mediastinum		
Gross cardiac enlargement (unclassified)	55	
Aneurysm of thoracic aorta	3	
Coaretation of aorta	4	
Aneurysm of pulmonary artery	1	
Calcified pericardium	1	
Mediastinal lymphadenopathy	12	
Anterior mediastinal tumor	7	
Substernal thyroid	6	
	89	6.6

TABLE 3.—*Analysis of Nontuberculous Causes for Rejection Found During the Chest X-Ray Examination of 105,141 Selectees*

		Per Cent of Total Rejectees
Inflammatory nontuberculous		
Bronchopneumonia	22	
Pneumonitis, etiology questionable	48	
Pulmonary abscess	2	
Chronic bronchitis	6	
Bronchiectasis, chronic	81	
Lobectomy for bronchiectasis	2	
	161	12.2
Neoplastic		
Atelectasis possibly due to bronchogenic tumor	2	
Pleural tumor	1	
Metastatic tumor	2	
	5	0.38
Miscellaneous		
Pneumothorax, spontaneous, nontuberculous	2	
Foreign body in lung	5	
Cystic lung disease	8	
Emphysema	17	
Pneumonoconiosis	12	
	44	3.3

During the twenty-two months between Aug. 1, 1941 and May 30, 1943 a group of 105,141 selectees were examined by an armed forces induction station team having headquarters in Michigan. The territory served by this station included largely an agricultural and rural section having only one city of over 150,000 population and few others with a population of over 20,000. The fact that this is a sparsely populated section of the state may be significant when comparing the results of

Read before the Section on Radiology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 15, 1944.

1 Spillman, Ramsay: The Value of Radiography in Detecting Tuberculosis in Recruits, J. A. M. A. **115**: 1371-1378 (Oct. 19) 1940.

2. Edwards, H. R., and Ehrlich, D.: Examination for Tuberculosis: Roentgenographic Findings of 41,809 Inductees and 9,541 National Guardsmen in New York City, J. A. M. A. **117**: 40-45 (July 5) 1941.

this analysis with those from other areas which include large cities and more densely populated rural communities. The period August 1941 through May 1943 must also be considered as significant when comparing with other analyses. The standards for acceptance, as outlined in Mobilization Regulations 1-9, were high during a large part of this period, and otherwise healthy young men were being disqualified because they had more than the arbitrary limit of ten intrathoracic calcified areas. These limits were relaxed soon after this country declared war, but the number of men disqualified because of apparently healed primary type tuberculosis still remained relatively high.

The method of examination, which during the past three years has been a topic of great interest, should be noted. The photoroentgen unit, utilizing 4 by 10 inch film with stereoscopic exposures on the same film, was used during the examination of about 80 per cent of the men in this series. When examinations were conducted in a satellite station, single 14 by 17 inch chest films were taken. In all instances single or stereoscopic 14 by 17 inch films were taken in doubtful or suggestive cases.

The results of this program will best be seen in the years to come. For the present an analysis of disqualifying defects found during the actual examinations will be of interest. Local reports and surveys of induction station examinations have appeared in the literature from time to time during the past two years.[3] The material to be presented at this time is only an addition to the surveys already made by others in other parts of the nation.

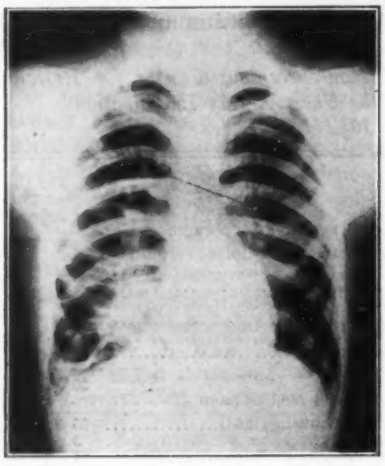

Fig. 1.—Eventration of the right diaphragm.

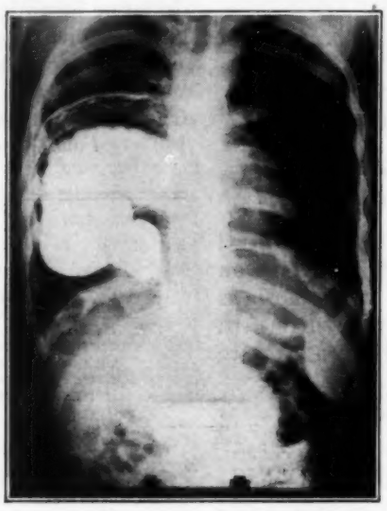

Fig. 2.—Same case as shown in figure 1, showing stomach located above liver.

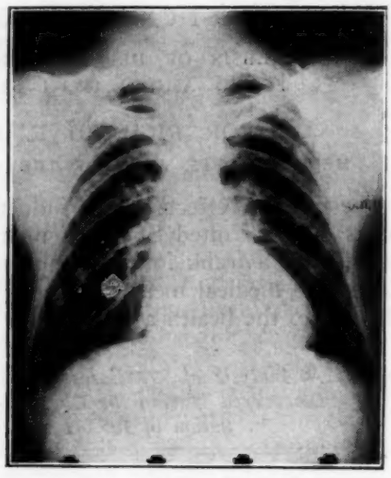

Fig. 3.—Coarctation of aorta.

On the basis of chest x-rays alone 1,328, or 1.26 per cent of the 105,141 selectees examined, were disqualified. Not all of these were permanently disqualified, many being deferred for a period of six months or more because of small lesions which could not be definitely classified as to activity. As no attempt has been made to determine the exact number of men returning for reexamination after having been deferred because of a doubtful lesion, a small number have been counted as chest rejections more than once, thus making some inaccuracy in the tabulation of the number of men rejected because of minimal pulmonary lesions.

Pulmonary tuberculosis, including the primary and adult type infections as well as unexplained pleurisies,

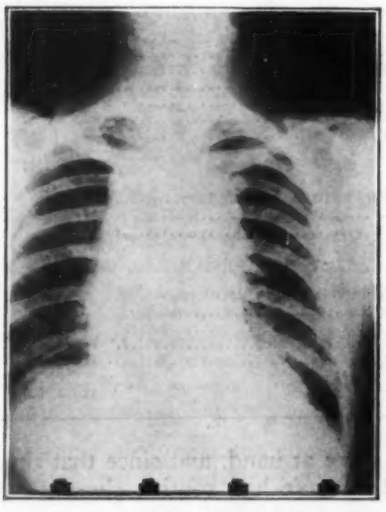

Fig. 4.—Mediastinal lymphoblastoma.

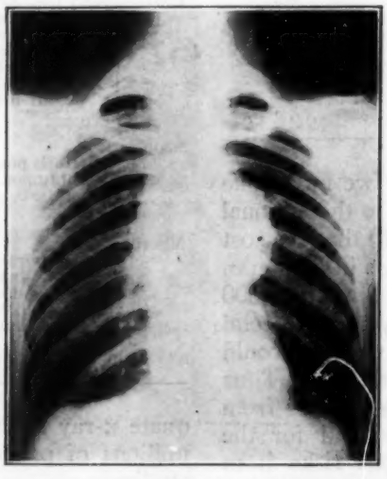

Fig. 5.—Aneurysm of thoracic aorta.

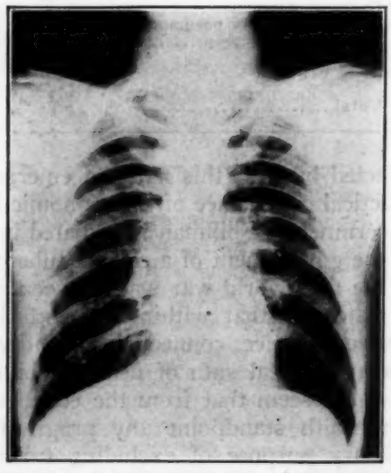

Fig. 6.—Metastases secondary to a testicular tumor.

3. Ashbury, H. E.; Whildin, J. G., and Rogers, F. T.: Roentgenological Report of Chest Examinations Made of Registrants at U. S. Army Induction Station No. 6, Third Corps Area, Baltimore, Md., May 1, 1941 to March 31, 1942, Am. J. Roentgenol. **48**: 347-351 (Sept.) 1942. Levitin, Joseph: Ten Thousand Chest Examinations with the Stereoscopic Photorcentgen Unit, Am. J. Roentgenol. **49**: 469-475 (April) 1943.

was the basis for rejection of 999, or 75.2 per cent, of those disqualified because of chest x-ray findings. Reference to table 1, showing a further tabulation of the tuberculous lesions, reveals that 60.7 per cent of these were reinfection type, 29.5 per cent were primary infection type, 8.5 per cent were pleural lesions and 1.2 per cent were lesions being controlled with either a therapeutic pneumothorax or a thoracoplasty. It is of particular interest to note further that of the 607 reinfection type lesions 526, or more than 86 per cent, were classified as minimal in extent. The total number rejected for all forms of pulmonary tuberculosis, 999, represents 0.95 per cent of the total selectees examined. This is probably a lower rate than will be found in areas having large cities and is actually not a representative figure for the population in general in this part of Michigan, as local board physicians were actively examining selectees and disqualifying obvious cases of tuberculosis during most of the period covered by this analysis. It is true that local board examinations became more and more sketchy, for obvious reasons, during the latter part of 1942 and 1943, and it may be that in the final analysis a representative cross section of the male population reached the induction station for examination. The fact that 1.2 per cent of those rejected because of tuberculosis were under some form of treatment for the disease bears this assumption out to some extent.

I have said that 75.2 per cent of those disqualified on the basis of chest x-rays had some form of tuberculosis. The remaining 24.8 per cent were disqualified for a variety of reasons, as illustrated in tables 2 and 3. Many of the defects listed in these tables were of course obvious to other examiners on the examining line. Thoracic cage deformities due to thoracic scoliosis and other bone disturbances such as old rickets were not considered as chest x-ray disqualifications, as they were obvious to the general musculoskeletal examiner and could best be evaluated by actual physical inspection plus a review of the chest x-ray. Thus, deformities of the thoracic cage and diaphragm, as shown in table 2, make up a total of only 2.2 per cent of those disqualified by the roentgenologist.

Among those disqualified because of lesions of the heart and mediastinum were many requiring consultation with the cardiac examiners before a diagnosis could be made. On the other hand, cardiac lesions requiring disqualification which had no gross changes in the cardiac silhouette were not included in this list. The coarctations of the aorta listed were only those in which an accurate x-ray diagnosis could be made.

The parenchymal nontuberculous lesions listed in table 3 include some with rather uncertain diagnoses. Many of those called pneumonitis may have been due to tuberculosis. Likewise, those labeled bronchiectasis were not all proved cases, although a good many had been previously so diagnosed by means of bronchography. Chronic bronchitis was a diagnosis arrived at only after consultation with the chest examiner and was considered cause for rejection when associated with asthma.

Neoplastic lesions were very infrequent. Of the two metastatic tumors, one was associated with a hard testicular tumor and was therefore accurately classified. The other was of uncertain origin.

The miscellaneous column (table 3) includes emphysema and pneumonoconiosis. These conditions were infrequent enough to warrant histories and consultation with the chest examiners to substantiate the diagnoses. The majority of those rejected because of pneumonoconiosis had been foundry workers, although a few had apparently acquired the condition as a result of several years' occupation as enamel sprayers.

Foreign bodies in the lungs were cause for rejection only when located in the bronchial system or when surrounded by a local reaction in the parenchyma.

The number of rejections for reasons other than tuberculosis may seem unusually large. A careful analysis of the many disqualifying conditions listed in tables 2 and 3 will reveal that they are entirely adequate causes for rejection. For purposes of illustrating and emphasizing this point, several reproductions of chest x-ray films are presented: figures 1 and 2, eventration of the right diaphragm in which the stomach and portions of the large bowel are located between the high diaphragm and the liver; figure 3, coarctation of the aorta; figure 4, mediastinal lymphoblastoma; figure 5, aneurysm of the thoracic aorta; figure 6, metastases secondary to a testicular tumor (this was missed during the genitourinary examination); figure 7, congenital cystic disease of the lung with fluid levels; figure 8, silicotuberculosis.

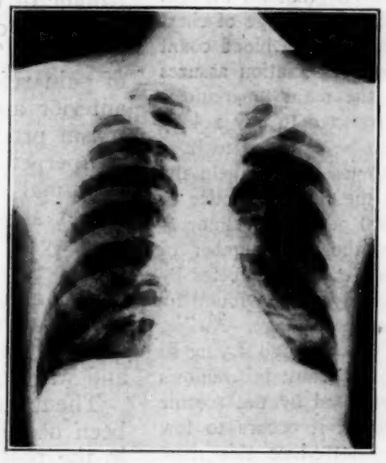

Fig. 7.—Congenital cystic disease of the lung with fluid levels.

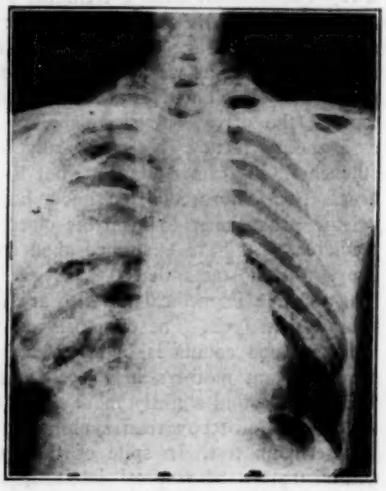

Fig. 8.—Silicotuberculosis.

In addition to the causes for rejection which have been illustrated, the nontuberculous group includes bronchopneumonia, nonspecific pneumonitis and other inflammatory conditions which were the basis for temporary rejection only.

SUMMARY

1. The United States Army, with the early cooperation of the various health agencies in the country, set up and organized facilities for routine chest x-ray examinations in the induction stations throughout the United States shortly after the Selective Service System began functioning.

2. A total of 105,141 selectees were given chest x-ray examinations by an armed forces induction station team in Michigan during the twenty-two months between Aug. 1, 1941 and May 30, 1943. Of this group 1,328, or 1.26 per cent, were rejected on the basis of chest x-ray findings.

3. Some form of pulmonary tuberculosis was the cause for rejection in 75.2 per cent of this total.

4. The remaining 24.8 per cent were rejected for nontuberculous lesions or deformities of the chest.

5. The total number rejected for all forms of pulmonary tuberculosis, 999, represents 0.95 per cent of the total selectees examined.

ABSTRACT OF DISCUSSION

DR. ROBERT G. BLOCH, Chicago: At the University of Chicago we have had some experience with x-ray examinations of the chest among employees and staff members and could match Dr. Selby's stories with some of our own. For instance, the head nurse of the operating rooms at Billings Hospital at one time was found to have active tuberculosis in such a survey. It was found that for months one girl working in the clinical laboratory had contaminated the sputum of nontuberculous patients. They all had been reported to the health department as having tuberculosis. We are now examining all clinic patients by fluoroscopy. Not being a radiologist, I should not like to enter into a controversy as to which is the superior method of x-ray examination from a technical point of view. Our reason for employing it is an academic one: we feel that all medical students should leave the school with a fair knowledge of chest fluoroscopy just as we ask them to be able to do a blood count and urinalysis. The National Tuberculosis Association assures us that the private physician's office is the main tuberculosis case finding agency. He can hardly be expected to buy a 4 by 10 inch fluorogram equipment, but he can be expected to have access to a fluoroscope; to know how to use it will help the private practitioner to keep his place in the future practice of medicine. We have examined about 60,000 persons by fluoroscopy. Joslyn states that 0.4 per cent of the total number of patients seen in medical practice are found to have diabetes by routine urinalysis. The diagnosis of blood dyscrasias found by routine blood counts is of an even lower percentage. Among the expectant mothers in the clinic of the Chicago Lying-In Hospital we find slightly more clinically important tuberculosis by chest fluoroscopy than syphilis is diagnosed by the routine Wassermann test. In spite of this evidence, it occurs to few administrators of medical institutions to introduce this most successful of all routine diagnostic tests. We estimated conservatively that during the first fifteen years of the existence of the University of Chicago Clinics 3,000 clinic patients seeking medical aid for any kind of complaint were permitted to slip by with an actively tuberculous condition of the lungs without that condition being diagnosed. Let us apply that figure to the adult population of the United States; according to the best information obtainable, about 45,000,000 adult people annually are seeking medical aid once or oftener in doctors' offices or clinics. This would suggest that every year over 600,000 people with clinically important tuberculosis of the lungs are seen by a physician without that condition being recognized. If the supposedly healthy population is searched for tuberculosis with so much zeal, we certainly should apply the same methods to the people who report for medical care.

CAPTAIN H. J. PRICHARD, Chicago: I have had experience with induction station chest work and haven't had the ambition to undertake a statistical analysis as Major Kinzer has done, so I can't give you accurate figures; but I did notice that there are some trends that were somewhat different from what he reports. Since I have been with the Chicago station we have examined about 400,000 chests, and we have about twice as many rejects for tuberculosis as Major Kinzer does. We have about 1.75 per cent consistently from month to month. Another difference we have had is in neoplasms. During this series of 400,000 chests the last tabulation showed 53 neoplasms in which dermoids particularly predominated in those cases which we were able to follow through to surgery; and while it was not strictly our business to do it, we did try to get further information voluntarily from these people if they had surgery and were investigated and treated. The dermoids were our most frequent diagnosis. Another condition is coarctation of the aorta. We have accumulated 23 cases of these.

MAJOR R. E. KINZER, M. C., A. U. S.: In comparing this work on chest x-rays, you will always have to consider who is reading them. I worked at all of the induction stations in this service command. I think I worked with Captain Prichard for a short time. I believe that there is a difference in the number of cases of tuberculosis found in a rural district and in a district which is made up of large cities. Apparently there is about 0.78 per cent difference between the tuberculosis rate in large cities and the rate as I found it in rural communities.

DEGENERATIVE ARTHRITIS OF THE HIP JOINT

TREATED BY ONE OR TWO STAGE ARTHRODESIS WITH METAL FIXATION (WATSON-JONES)

G. EDMUND HAGGART, M.D.
BOSTON

Patients with unilateral degenerative arthritis (hypertrophic or osteoarthritis) of the hip joint often exhibit a degree of disability which may be relatively pronounced. This loss of function is primarily the result of pain referred from the region of the hip down the anterior and medial thigh to the knee joint. Muscle spasm producing flexion adduction contracture of the hip perpetuates a vicious cycle because of the resultant abnormal weight bearing on the extremity. While conservative treatment will consistently relieve the severity of symptoms, the results of such therapy have not been permanent. Indeed, usually sooner or later, and as a rule the former, symptoms recur, particularly if the patient is relatively active, as when engaged in a type of work that necessitates long hours of standing and walking about.

The most satisfactory results at the Lahey Clinic have been obtained with fusion of the involved hip, which in the past was secured by a bone graft transplanted from the iliac wing to bridge the prepared area over the femoral neck, head and adjacent ilium. Once a firm arthrodesis developed, the patient was relieved of his major complaint—pain. In the majority of patients so treated there was a good functional result. Our experience with other types of surgical intervention has been unsatisfactory. In none of the patients treated by osteotomy of the femur, either subtrochanteric or between the trochanters, by acetabuloplasty, including removal of hyperplastic bone on the femoral neck and head, or by arthroplasty was pain completely absent.

Conservative therapy, such as bed rest, traction or plaster, including physical therapy, would always ameliorate, at times completely relieve, symptoms, but if the patient was at all active the pain again recurred. Furthermore, these individuals do not tolerate well a long period of bed rest.

It is pertinent to mention the results obtained with arthroplasty. In succession, chromized membrane, fascia lata and finally vitallium have been employed as the interposition medium. In 18 patients of this age group (50 to 65 years) the results have been disappointing when vitallium cup arthroplasty was utilized. All have some pain on weight bearing, and the range of motion is limited. When walking the majority require

From the Department of Bone and Joint Surgery, the Lahey Clinic. Read before the Section on Orthopedic Surgery at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 14, 1944.

a cane and in some instances a crutch. In younger patients (third and fourth decades) with degenerative changes in the hip resulting from such conditions as Legg-Perthes disease, fracture or a slipping of the proximal femoral epiphysis, vitallium cup arthroplasty has produced definite improvement in the function of the joint. I believe the comparatively good results in the younger age group is due to their greater stamina and ability to perform the repetitious and monotonous exercises plus better developed and controlled musculature. The older patients early exhibited fatigue, which became more rather than less pronounced as time went on. Hence this group was simply unable to carry out a most important part of the program, namely exercises in the postoperative period.

These experiences indicated a return to the hip fusion operation. However, in these older patients hip joint arthrodesis, by means of a bone graft, is a formidable procedure. Furthermore, the patient must remain in bed in a bilateral hip spica followed by a single spica for a minimum period of three to four months. Vigorous individuals may become ambulatory after application of the single spica, but even so it is a debilitating experience. Return of the normal knee joint function was often long delayed after the patient was out of plaster, in spite of the fact that metal hinges, as suggested by Leland,[1] were routinely incorporated in the single plaster hip spica case, to permit relatively early motion, after weeks of complete immobilization.

It was finally decided to treat those patients selected for operation by the method of Watson-Jones,[2] since he stated that the procedure was especially applicable to degenerative arthritis of the hip joint. Watson-Jones presented this operation before the Section on Orthopedic Surgery of the American Medical Association in 1938.

A review of American literature reveals one paper on this method, that by Warren White,[3] who reports satisfactory results in 7 hips, 2 of which were considered tuberculous. White employed the one stage procedure, that is, nailing only, and stressed the resultant prevention of an adduction deformity, especially in the growing period.

This paper is a report of our experience with this operation, in most instances a two stage procedure as described. Although the number of cases is small, they have been carefully observed and the results are decidedly encouraging. The use of this method will be continued because it causes a fusion of the hip—as noted, the most satisfactory therapy in unilateral degenerative arthritis of this articulation—and, furthermore, hip arthrodesis is obtained with a comparatively minimal degree of bed rest, knee joint disability and general debility.

The belief that a patient with an ankylosed hip would of necessity have pain in the low back has frequently deterred us in the past from advising and carrying out an arthrodesis of the hip joint. We then subscribed to the belief that because a stiff hip placed an increased strain on the low back and hence would produce pain, particularly if the patient had some arthritic changes in the lumbosacral spine, an operation designed to fuse the hip joint should not be considered. However, as Watson-Jones pointed out, in the presence of a unilateral arthritic hip this articulation could be ankylosed and hence symptoms and muscle spasm relieved, with the result that the patient not only has no pain in relation to the hip joint but also does not develop a painful low back. Furthermore, because of the absence of muscle spasm, the individual often will exhibit an increased range of motion in the low back. This fact was becoming increasingly apparent with the utilization of a bone graft to obtain hip fusion. Consequently, since the method of Watson-Jones offers a simpler procedure to obtain that end result, it was decided to try it out in selected cases.

SELECTION OF CASES

Patients with arthritic involvement of both hip joints are not suitable cases for arthrodesis. The optimum type is the individual in whom only one hip is involved. No patient is operated on until careful medical study has shown that his condition will permit such major surgery.

The type of patient selected for fusion operation is indicated by a brief outline of a typical history, together with the significant data. Such a patient is a relatively vigorous person in good general health, between the ages of 50 and 65, who seeks medical advice because of disabling hip pain on weight bearing and progressive loss of ability to stand and walk. Examination reveals moderate to pronounced flexion adduction deformity of the involved hip, with considerable limitation of motion. The leg is held in 10 to 20 degrees external rotation, and there is obvious atrophy of the musculature of the buttocks and thigh. Roentgenograms of the affected hip joint exhibit a narrow joint space, with proliferative bone changes and cystic degeneration in both the acetabulum and the femoral head.

OPERATIVE TECHNIC

In the majority of patients submitted to surgery, the operation is carried out in two stages. The first stage is an intra-articular arthrodesis, while in the second stage, performed at the end of ten days to two weeks, a flange nail (Smith-Petersen) is passed through the trochanter, neck and head of the femur and into the dense bone of the ilium just superior to the acetabulum. The one stage operation, that is, pinning alone, was employed only when the patient's condition did not permit a more extensive procedure.

First Stage.—The hip joint is exposed by the usual anterior incision. This entails subperiosteal reflection of the tensor fasciae latae and a part of the gluteus medius muscles from the lateral aspect of the ilium, while the distal portion of the incision is deepened down to the hip joint between the sartorius and the tensor fasciae latae muscle. The rectus muscle is then reflected distally after division of its tendon insertion into the anterior inferior iliac spine—the anterior superior joint capsule is excised and the head of the femur dislocated from the acetabulum. Any loose bodies in the acetabulum are removed, while hyperplastic synovial membrane is cut away from the neck of the femur and acetabulum (fig. 1).

The exostoses and cartilage on the head of the femur are cut away, first, by chisel, and this completed by the use of a cup reamer, modified from the type originally devised by Murphy. Every effort is made to retain the relatively normal contour of the femoral head, at the same time reducing its size to a minimum consistent with exposure of raw bleeding bone. During this step it is important that the acetabulum be packed off with saline moistened gauze to prevent fragments

1. Leland, G. A., cited by Scudder, C. L.: The Treatment of Fractures, ed. 11, Philadelphia, W. B. Saunders Company, 1938, p. 277.
2. Watson-Jones, R.: Arthrodesis of the Osteoarthritic Hip, J. A. M. A. **110**: 278 (Jan. 22) 1938.
3. White, J. W.: Smith-Petersen Nail Fixation in Hip Disease, South. M. J. **36**: 333 (May) 1943.

of cartilage from falling therein, which later might be missed. With a motor driven 1/16 inch bit, numerous channels are driven through the head of the femur well into the neck, thus aiding in rapid vascularization. And finally, by means of a small V shaped chisel, the entire articular surface of the femoral head is successively elevated, that is, "shingled" throughout. The object of these steps is to produce more rapid bone growth across the joint line.

By means of a motor driven burr the cartilage of the acetabulum is next removed, and at the same time ridges or pockets in the bone of the cavity are obliterated, so that the articular surface of the acetabulum presents a uniform, even, raw bleeding bone surface. Particular care is taken to remove all cartilaginous and bone débris. Then with a 1/16 inch bit, multiple holes are drilled in the floor of the acetabulum, penetrating both diploes in order to hasten vascularization and hence fusion, which is additionally expedited by permitting the soft bone shavings resulting from the use of the bit to remain in the acetabulum.

The head of the femur is now replaced in the acetabulum and the wound closed. A Penrose rubber tube drain, removed in twenty-four hours, is efficacious in preventing an accumulation of serum. In obese patients a single plaster hip spica is applied, while in slight or more easily handled individuals Russell skin traction to the extremity has often been instituted. In the average case, however, use of the plaster spica has been more satisfactory, as it permits repeated change of the position of the patient with minimum pain and discomfort.

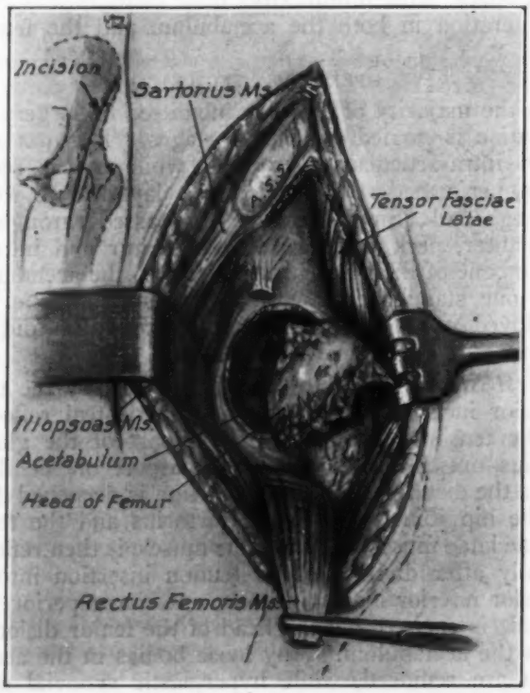

Fig. 1.—Drawing made at operation to illustrate the anterior approach to the hip joint. The head of the femur has just been dislocated from the acetabulum. Note the degenerative changes. See text for technical details.

Second Stage.—Ten days to two weeks later the second stage operation is performed, this time on the fluoroscopic table, again under spinal anesthesia (fig. 2). This procedure utilizes essentially the same technic so commonly employed in nailing fractures of the femoral neck. Under intermittent fluoroscopic observation a guide wire is passed into the center of the neck and head of the femur, up to the articular margin, and the correct position determined in relation to the dense iliac bone just above the acetabulum. The length of the nail required is estimated by a measuring rod photographed on x-ray film, as well as by checking the measurements of a guide wire. A cannulated Smith-

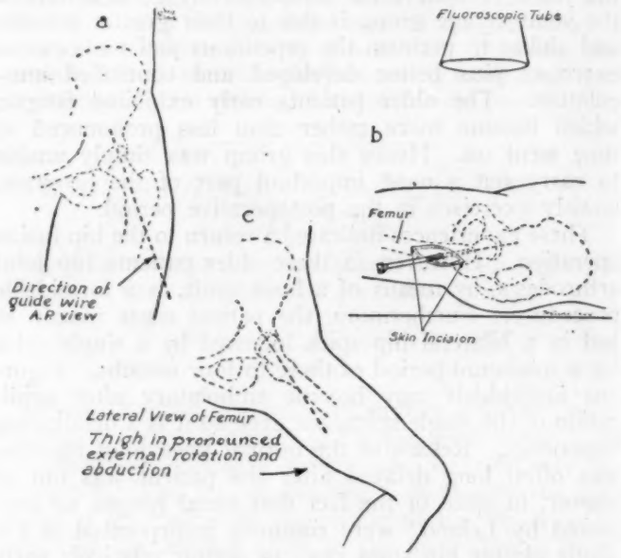

Fig 2.—Line drawing to illustrate the various steps in the second stage procedure. The broken line indicates direction and position of the guide wire, as described in the text, and is introduced only up to the articular margin of the femoral head, thus permitting easy visualization in the lateral plane by "frogging" the hip. A Smith-Petersen nail is then introduced over the guide wire, and it is important to note that it terminates in the lateral portion of the superior acetabular region, where the iliac bone is particularly dense (see fig. 5).

Petersen flanged nail is then introduced through a small incision over the lateral aspect of the trochanteric area and driven in along the guide wire through the trochanter, femoral neck and head and into the bone of the superior acetabulum.

By introducing the guide wire up to the articular margin of the femoral head the entire second stage procedure can be rapidly carried out. With the wire in this position it is possible not only to visualize the trochanter and head and neck of the femur in the anteroposterior view, but by "frogging" the hip joint a true lateral perspective of the position of the wire in the femoral neck and head is obtained. Thus centralization of the guide wire is secured in relation to the femoral neck and head, while in the anteroposterior fluoroscopic view the relation of the wire to the iliac bone above the acetabulum is likewise determined.

Undue exposure of the patient to x-rays from the use of the fluoroscope is prevented by short, intermittent observations, while the operator's hands at no time come into the fluoroscopic field, because of the type of instruments employed. They were designed by Warren White [4] for nailing fractures of the femoral neck and, in my opinion, are an indispensable part of the equipment for the operation here described.

Before driving the nail through the head of the femur into the ilium, it is important that the position of the extremity be carefully rechecked in relation to the trunk. The most satisfactory position is that of 30 to 35 degrees hip flexion, neutral rotation and midposition to 5 degrees abduction.

The final step is firm impaction of the head of the femur against the surface of the acetabulum, following which the small lateral wound of the thigh is closed

4. White, Warren: Personal communication to the author.

and a short plaster hip spica applied. Application of a long leg plaster spica has not been found necessary, since the nail controls any tendency toward rotation and adduction. A short hip spica, however, has been most helpful, as in many of these cases the iliac bone in particular was found to be so decalcified that even with the nail in situ a certain amount of actual hip motion was possible, especially in the anteroposterior plane. No attempt has been made to transfix the head of the nail in the lateral cortical shaft of the femur. To date, none of the nails have extruded or tended to slip back.

Following the second stage operation, the average patient treated by this technic has been kept in bed for two to three weeks, during which period muscle exercises are begun with particular reference to development of quadriceps function and knee joint motion. These exercises are continued a minimum of three months. When allowed up in a single short hip spica, the patient begins progressive walking with crutches. Since immobilization by a long plaster hip spica is unnecessary, knee motion has been maintained in all patients.

STATISTICS

The findings on 12 patients following operation have been carefully observed over a one to five year period, and the results obtained are decidedly encouraging. The favorable results in these patients with degenerative arthritis of one hip joint offer a sharp contrast to the present status of individuals afflicted with a similar type of hip disability who have been treated by other methods (figs. 3, 4 and 5).

The average age of this group is 56 years. The oldest patient treated was 68 years. The operation was advised on the basis of pronounced to complete disability because of hip pain which had been progressive over an average period of four years.

The complication of intratrochanteric fracture due to a fall has so far not occurred. It is believed that insistence on postoperative walking with crutches from four to six months has prevented such falls and hastened fusion of the hip joint; furthermore, the use of crutches has been a decided aid in permitting early ambulation as well as assistance in regeneration of muscle power.

ONE STAGE PROCEDURE

The one stage operation was employed when the patient was considered a poor surgical risk but was

Fig. 3.—Appearance of the hip joint of a housewife aged 50 who was completely disabled by pain adduction and flexion deformities of the left hip, progressively more severe since fracture of the neck of the left femur three years previously. The fracture had been nailed elsewhere; the nail is still in place. Note pronounced loss of joint space, cystic degeneration in the head of the femur and proliferative reaction around the adjacent acetabulum.

in great pain that was not relieved by adequate conservative treatment.

Three patients were operated on by this procedure, that is, passing a Smith-Petersen flanged nail through the base of the trochanter, neck and head of the femur into the iliac bone just above the acetabulum. The time required to obtain hip join anklyosis was over twice as long as the period in which firm joint fusion was secured by means of the two stage procedure. The latter varied from three to four months. Another

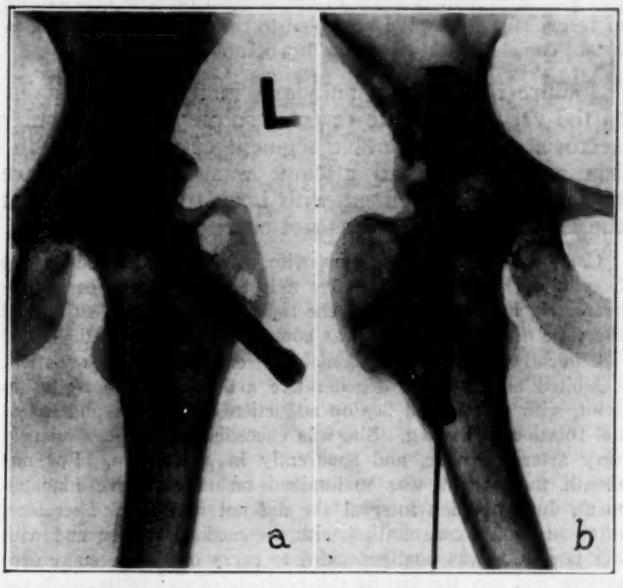

Fig. 4.—Angle at which the pin is best inserted for ankylosis of the hip: *a*, condition on admission. Pin was inserted elsewhere for fracture of the neck of the femur. The pin was withdrawn at the first stage arthrodesis procedure. *b*, final stage of arthrodesis as described in text. Note that the pin terminates in the dense iliac bone just above the acetabulum. Guide wire has not yet been withdrawn, nor has head of femur been impacted against the acetabulum. Compare with figure 5.

obvious disadvantage encountered in these 3 patients was the fact that, even under anesthesia, practically no correction of the existing deformity, that is, hip flexion and external rotation of the leg, could be obtained. Hence, fusion of necessity had to occur in this abnormal weight bearing position.

RESULTS

Ten patients obtained a painless, solidly ankylosed hip joint, resulting in a decided increase of activity and ability to carry on previous occupations. In each instance the knee joint function equaled or exceeded in range that present before operation. Previously present low back symptoms were not exaggerated.

There were two failures. The data on these individuals are presented in case histories:

CASE 1.—M. N. B., a housewife aged 57, admitted to the clinic on March 10, 1942 with a complaint of pain and practically complete disability in relation to the left hip joint, stated that in July 1940 she had a severe fall down a staircase and sustained a fracture of the left hip. She was admitted to a hospital in a neighboring town, operated on and the fracture pinned, and allowed on her feet in four weeks. No further discomfort was experienced until five months later, when she caught a severe cold and then developed a stiffness of the hip which rapidly developed into a completely disabling pain. This had continued until just prior to admission, when the pin had become loose, and it was therefore removed.

On admission she exhibited decided limitation of motion in the affected hip, with pronounced muscle spasm. The roentgenogram (fig. 6 *a*) revealed an old fracture through the neck of the femur which had healed in good position. The site of the previously placed internal pin fixation can be seen. The films further exhibited an area of considerable density in the head of the femur, indicating that a portion of the head had

not revascularized as well as an extensive degenerative arthritis of the hip joint.

The first stage operation was performed on May 4. A large fragment of the head was found to be definitely necrotic and therefore removed and replaced by bone transplanted from the adjacent ilium. The second stage was done ten days later.

Since that time the patient has not been free from discomfort and at present is again in the hospital because of a failure of fusion (fig. 6 *b*). We now plan to carry out a bone graft to obtain complete fixation of the hip joint.

Failure of hip joint ankylosis in this case was due to the very large bone defect resulting from avascular necrosis of a considerable segment of the head of the femur. Although an attempt was made to replace this dead bone fragment with bone transplanted from the adjacent ilium, it was not successful.

CASE 2.—A. N. C., a housewife aged 60, admitted to the hospital on May 12, 1943, gave a history of three years' progressively increasing pain in the right thigh and hip, so that at the time of admission she was completely incapacitated.

Clinically and by roentgenologic examination the patient exhibited an advanced degenerative arthritis of the right hip joint, with pronounced flexion adduction contracture and external rotation of the leg. She was exceedingly fragile, obviously very arteriosclerotic, and apparently in great pain. For one month the patient was maintained on conservative management, during which interval she did not improve. Therefore, after additional consultation with the medical service and with her family, it was finally decided to carry out a one stage procedure and pin the hip in the position of deformity with the hope that such fixation would reduce pain and discomfort.

The patient was therefore operated on on June 12; a one stage procedure was carried out in which the hip was pinned without incident. She recovered from operation without surgical complications, but her preoperative disorientation became more pronounced and it was in no sense possible to enlist her cooperation in carrying out exercises or progressively increasing her activities.

While a subsequent report from the patient's home physician indicates that by roentgenologic examination she has an ankylosis of this hip joint, nevertheless

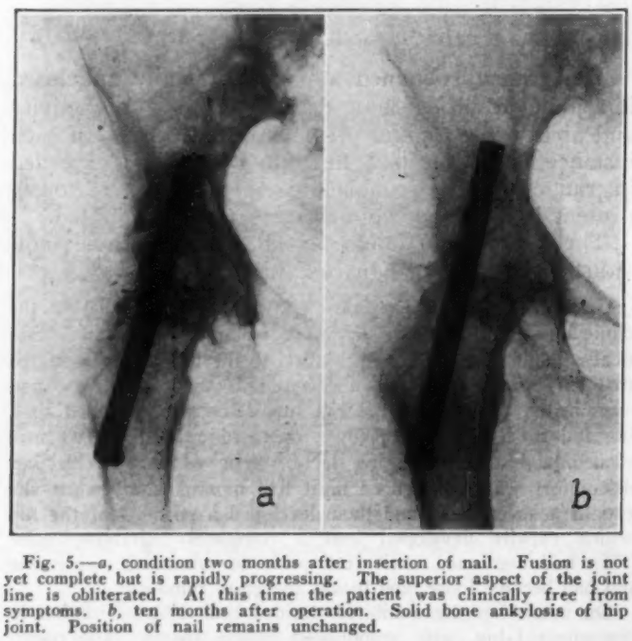

Fig. 5.—*a*, condition two months after insertion of nail. Fusion is not yet complete but is rapidly progressing. The superior aspect of the joint line is obliterated. At this time the patient was clinically free from symptoms. *b*, ten months after operation. Solid bone ankylosis of hip joint. Position of nail remains unchanged.

the result is a failure because of poor selection, due to extensive arteriosclerosis with consequent brain changes that prevented the patient from cooperating in her postoperative management.

SUMMARY AND CONCLUSIONS

Unilateral degenerative arthritis of the hip joint often results in disability which the patient attributes to pain in the region of the hip and referred down the anteromedial side.

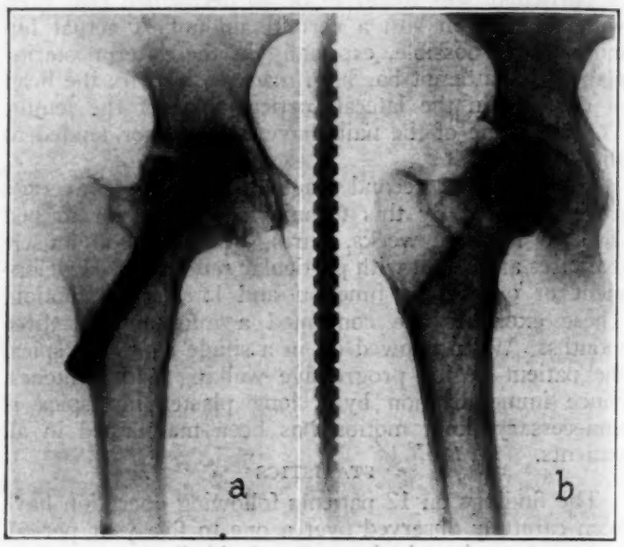

Fig. 6.—*a*, appearance on admission. Note large area of bone sclerosis in the superior portion of the femoral head and cystic areas of degeneration in the remainder of the head. Notched metal bar, an additional aid in measuring length of nail, is described in text. *b*, failure of fusion twenty-two months postoperatively. Note bone absorption about the pin (see text).

In our hands patients within the age group of 50 to 65 years have not obtained permanent relief by conservative treatment nor has arthroplasty eliminated pain. The best results followed arthrodesis of the hip joint, which operation in this age group is now performed in two stages.

It is important to note that no patient is advised operation unless a general medical examination indicates that his condition will permit such treatment.

The course of 12 patients in the age group 50 to 65 has been followed for from one to five years. There were no operative fatalities. Ten patients obtained firm, bony ankylosis of the hip joint and subsequent complete relief of pain, definite improvement in function and the ability to return to their previous activities. There were two failures.

605 Commonwealth Avenue.

ABSTRACT OF DISCUSSION

DR. DAVID M. BOSWORTH, New York: Operative intervention on these old people is a grave risk, not on a percentage basis, because the percentage of deaths is small, but in the individual case. Basically the patient has to risk his life to free himself from pain. So, fusion of a hip by any method is a relatively important decision for both the patient and the doctor to make. Dr. Haggart probably would prefer fusion with an iliac or other bone graft were such procedure not more difficult and lengthy. I would be glad to have him comment on this. He states that his experience with other types of surgical intervention (arthroplasties) has been unsatisfactory. At St. Luke's we would concur with that statement. All other types of reconstruction for degenerative arthritis of the hip aside from arthrodesis were unsatisfactory, and we have tried many methods. I would question the efficacy of his one stage procedure. Metal never grows bone. I am not in agreement that driving metal nails across hip joints with residual cartilage intact will secure anywhere near the percentage of solid arthrodeses that a débridement of the joint and a bone graft will. Metal does permit fixation and is a great adjunct for

fixation. Therefore I do not agree that his two stage operation might equal the percentage of results secured by fusion with a bone graft. End result studies not based on recent personal follow-up study of the patient are apt to be misleading. What were some of the complications that ensued? Were there any hematomas or any infections following the removal of drains? Was there any difficulty with wound healing? What was the final position of the hip as compared with the position you put it in? Did any of them roll out to a position of external fixation; did increased flexion take place? Did any of the nails wander from their immediate operative position? A nail with only an inch support in the ilium might shift its position over a period of months. Were there any cases of impaired knee function? I still believe that, in arthrodesis of the hip, iliac grafts or grafts of bone are best, associated with thorough débridement of the joint space.

DR. HERMAN C. SCHUMM, Milwaukee: Dr. Haggart's success was due to the thought and care which he gave to the individal case. In all cases of hip surgery the careful consideration of the patient, which means a careful selection of the patient for the particular type of operation, is the prime requisite. Dr. Haggart has certainly carried out that requisite. There is no question also that his surgical technic is excellent, which is an aid to any surgical procedure. The Watson-Jones operation has its place. There are cases in which a definite arthrodesis cannot be done because of the physical condition of the patient or probably because his life has to be so regulated that he does not have to carry on a strenuous physical life. Those cases can sometimes be helped by a single nailing. Dr. Haggart gives a great deal of credit to Watson-Jones for his operation. If one is going to obtain maximum results in a large majority of cases one is going to have to resort to firm ankylosis. For patients who have a great deal of activity ahead of them, whose physical condition is excellent, there is no operation that can take the place of a good arthrodesis. None of our classic types of operation that attempt to preserve motion will fill the bill. Under the stress and strain of years they are bound to give way, and pain is bound to recur. I should like to ask Dr. Haggart his reasons for doing a two stage instead of a one stage operation. Some cases that are nailed will never go on to an arthrodesis. In a small series that I have done, firm arthrodesis has resulted; 1 patient was probably tuberculous and 2 had arthritis, a young child who had considerable erosion of the hip and a young man who had trouble from childhood.

DR. J. WARREN WHITE, Greenville, S. C.: There is no question about the desirability of doing an intrajoint arthrodesis, but some patients cannot stand that major procedure, and so I have in 1 instance used two nails. Watson-Jones used a supercaliber nail, which cannot be obtained easily. I had a regular nail break, as you will note from my paper on the subject that came out a year ago, and I decided I had better employ something else and hit on the idea of using two nails. I have packed in two nails, and I think I obtained good solidity.

DR. WALTER BLOUNT, Milwaukee: I question the need for an intra-articular operation in most cases. There is no doubt that more rapid fusion is obtained following the removal of the articular cartilage. It has been repeatedly shown that this operation alone is not sufficient. Internal fixation is a valuable addition. It is my contention that, if this internal fixation is adequate, removal of the cartilage is not necessary. If one wishes to fasten two boards together so that they will not move, one does not put a single screw, nail or bolt in the center of the board. Not even one Smith-Petersen nail will hold them. Dr. Haggart notes that motion at the hip following operation requires the application of a cast. Two or more nails will effectively hold the boards securely. Two nails, as suggested by Warren White, are definitely better than one. I prefer to use multiple adjustable nails. I started by using three. Fixation is obtained but the nails do break. I now use more and heavier nails with great confidence. It is imperative that nuts be used if the nails are to be prevented from wandering inward. A lateral view can be obtained by the use of an orthopedic table with a wooden post. The nails must be accurately placed if firm immobilization is to be obtained. The average stay in the hospital is two weeks. I have not used a cast in any of my cases. I feel that the postoperative complications are greatly reduced. Another reason why I prefer the smaller nails is that they can easily be drilled into the sclerotic bone, whereas it is sometimes difficult to drive any type of a nail into this substance. It is advisable to drill extra holes across the joint to encourage ankylosis. In some of my cases I have x-ray proof of bone union. It may take several years for the hips to fuse. In the interval they are solidly nailed and the patients walk without crutches after six months. It may be that some of the cases develop fibrous union rather than complete bony ankylosis. In any event they are relieved of pain. Their gait is greatly improved. Their deformity is reduced. The patient's symptoms are relieved by an operation which is far less formidable than an intra-articular fusion.

DR. G. EDMUND HAGGART, Boston: In reply to the questions of Dr. Bosworth, Dr. Blount answered one. I would prefer to employ a bone graft, but the type of patient here described does not react as favorably—at least in my hands—as with the two stage operation. One definite failure of fusion was described. The second case was a failure because of poor selection, but fusion of the hip joint was obtained. Two other patients I have not had the opportunity to examine personally, but I have received reports from consulting physicians that the roentgenograms reveal strong, firm fusion and the patients are free from any symptoms with reference to the hip joint. Infection occurred in 1 case, fortunately only of the small incision on the lateral side of the thigh. The incision of the original first stage procedure healed perfectly. Infection occurred as a result of poor technic. I have always found the fluoroscopic room a difficult place in which to keep the operative field sterile. This wound has now remained healed five months. Roentgenograms did not reveal any evidence of bone infection. There have been no pulmonary complications of any kind in this group. Why the two stage procedure? Because these patients react more favorably under that regimen than after a one stage operation. In patients more recently operated on, the entire procedure has been carried out at one operation and they have not done as well as similar types of patients treated by the two stage procedure. The operation can be done in one stage, but these people are very fragile and I believe that the two stage operation works out much better than when the operation is performed all at one time. With the exception of the two failures, all the remaining patients have returned to their previous activities. They have other complaints, but not in relation to the hip or as a result of surgery on the hip joint. I agree with Dr. White and Dr. Blount that you would probably obtain better fixation with two nails than with one nail. However, performing the operation in the manner described in the paper achieved the objective, namely hip fusion. I have had no experience with more than one nail. In a number of these patients, immediately following introduction of the nail there has been obvious definite motion at the hip—not abduction, adduction or rotation, but demonstrable anteroposterior motion. I attribute this to the fact that the bone is soft, as is often the case with these older persons. This is the reason for applying the short plaster spica following the second stage procedure. I consider this spica extremely important. Likewise the fact that we have insisted that the patients use crutches with progressive weight bearing for an average period of six months has been of additional aid in preventing complications. However, the patients are up and about, out of the hospital. This activity has also prevented complications that might otherwise have arisen. Dr. Blount certainly has hip joint fixation, but it seems like a considerable amount of hardware. I prefer the simple Smith-Petersen nail.

Strength of Sunlight.—Artificial light, even if perfected to the highest degree, has never the strength of sunlight and is more fatiguing to the eyes, as it does not stimulate the retina by a constant change of the intensity and color of the light rays, as does daylight. Every sensitive person will rejoice to see sunlight again when he comes out of an artificially lighted museum into the day.—New Architecture and City Planning, A Symposium, edited by Paul Zucker, New York, Philosophical Library, 1944.

ONE DOSE PENICILLIN TREATMENT OF CHRONIC GONORRHEAL VAGINITIS IN CHILDREN

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ROSS TILBURY, M.D.
AND
JESSE COLLEY, M.D.
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The treatment of chronic gonorrheal vaginitis has undergone rapid changes in the past few years. Sulfonamide therapy has brought rapid cure of this stubborn disease in the majority of instances. However, since several cases have been found to be sulfonamide resistant, estrogen therapy (diethylstilbestrol) has been recently advocated. With the advent of penicillin, it seems quite evident that this drug is by far the most effective and the safest to use in the therapy of gonorrheal infections.

It is our purpose in this paper to describe our experience with a simplified one dose penicillin treatment of chronic gonorrheal vaginitis. The results in 16 cases show that patients with this chronic disease need no longer be hospitalized but can be satisfactorily treated in the office and rapidly cured.

From the Department of Pediatrics, Louisiana State University School of Medicine and the Charity Hospital of New Orleans.

To conserve time and space, pertinent facts regarding our 16 cases are presented in tabular form.

COMMENT

Diagnosis was established by smear only if the case was clearcut and gram negative intracellular organisms were found in pus cells. In all other instances diagnosis was made both by smear and by culture. Most patients received sulfonamide and/or estrogen therapy for varying periods of time prior to institution of penicillin therapy. Sulfonamide therapy was discontinued either because of toxicity or of failure to respond. Estrogen therapy was discontinued because of failure to respond, lack of cooperation or uterine bleeding (cases 4 and 6). Sulfathiazole and sulfadiazine were given in doses of 1 grain (0.06 Gm.) per pound daily divided into four equal doses and administered at 8 a. m., 12 noon, 4 p. m. and 8 p. m. Estrogen therapy when instituted was generally given after sulfonamide therapy. Diethylstilbestrol was given orally in doses of 1 mg. daily.

Penicillin therapy was not started until all other forms of treatment were discontinued for at least one week. Penicillin 100,000 units was dissolved in 20 cc. of isotonic solution of sodium chloride and injected intramuscularly. In a few instances 3 minims of epinephrine 1:1,000 was added to the penicillin solution in order to prolong the penicillin effect. The

Children with Chronic Gonorrheal Vaginitis Given One Dose of Intramuscular Penicillin 100,000 Units

Patient	Age	Race	Duration of Disease	Diagnosis by		Previous Therapy		Penicillin Intramuscularly	Results		
				Smear	Culture	Sulfonamide	Diethylstilbestrol		Vaginal Discharge	Smear	Culture
1. C. J.	1 mo.	Negro	Since birth	Positive	Positive	Sulfathiazole 2 wks.	None	100,000 units in saline solution	Cleared in 2 days	Negative for 3 wks.	Negative
2. B. J.	1 mo.	Negro	Since birth	Positive	.....	Sulfathiazole 4 days	None	100,000 units in saline solution	Cleared in 2 days	Negative for 2 wks.	
3. E. M. S.	1 mo.	Negro	Since birth	Positive	Positive	None	None	100,000 units in saline solution	Cleared in 72 hrs.	Negative for 1 mo.	Negative for 1 mo.
4. M. B.	6 mos.	Negro	5 mos.	Positive	Positive	Sulfathiazole 1 mo.	3 mos.; stopped due to vaginal bleeding	100,000 units in saline solution	Cleared in 48 hrs.	Negative for 3 wks.	Negative for 3 wks.
5. J. K.	7 mos.	White	3 mos.	Positive	Positive	Sulfathiazole 2 wks.; sulfadiazine 2 wks.	1 mo.	100,000 units in saline solution	Cleared in 3 days	Negative for 3 wks.	Negative for 3 wks.
6. E. F.	8 mos.	Negro	6 mos.	Positive	Positive	Sulfathiazole 3 wks.; sulfadiazine 2 wks.	3 mos.; estrogenic response; vaginal bleeding; improved but not cured	100,000 units in saline solution	Cleared in 3 days	Negative for 2 mos.	Negative for 2 mos.
7. A. C.	10 mos.	White	3 mos.	Positive	.....	Sulfathiazole 2 wks.	1 mo.	100,000 units in saline solution	Cleared in 2 days	Negative for 3 wks.	
8. M. W.	1 yr.	Negro	6 mos.	Positive	Positive	Sulfathiazole 2 mos.	2 mos.	100,000 units in saline solution	Cleared in 2 days	Negative for 4 wks.	Negative for 4 wks.
9. C. A.	1 yr.	White	3 mos.	Positive	Positive	Sulfathiazole 2 wks.	1 mo.	100,000 units in saline solution	Cleared in 2 days	Negative for 2 wks.	Negative for 2 wks.
10. A. K.	1½ yrs.	Negro	7 mos.	Positive	Positive	Sulfathiazole 1 mo.; sulfadiazine 1 mo.	2 mos.	100,000 units in saline solution	Cleared in 2 days	Negative for 6 wks.	Negative for 6 wks.
11. J. A. C.	2 yrs.	White	6 mos.	Positive	Positive	Sulfathiazole 2 wks.; sulfadiazine 2 wks.	Diethylstilbestrol 6 wks.	100,000 units in saline solution	Cleared in 2 days	Negative for 4 wks.	Negative for 4 wks.
12. F. B.	3 yrs.	White	1 mo.	Positive	.....	Sulfathiazole 3 wks.	.....	100,000 units in saline solution	Cleared in 2 days	Negative for 2 wks.	Negative for 2 wks.
13. V. H. D.	5 yrs.	Negro	3 mos.	Positive	.....	.....	.....	100,000 units in saline solution	No response; subsequently cleared with 8 divided doses of 10,000 units each 3 hrs.	Positive	Positive
14. C. O.	7 yrs.	Negro	7 mos.	Positive	Positive	Sulfathiazole 1 mo.	2 mos.	100,000 units in saline solution	Cleared in 2 days	Negative for 2 mos.	Negative for 2 mos.
15. B. J. W.	10 yrs.	Negro	2 mos.	Positive	Positive	.....	.....	100,000 units in saline solution	Cleared in 24 hrs.	Negative for 2 wks.	Negative for 2 wks.
16. D. L.	11 yrs.	White	1 yr.	Positive	Positive	Sulfathiazole 2 mos.	Diethylstilbestrol 3 mos.	100,000 units in saline solution	Cleared in 3 days	Negative for 1 mo.	Negative for 1 mo.

vagina was carefully examined for discharge every day. No local or systemic therapy was given during penicillin treatment. Smears and/or cultures were taken every other day for the first week and weekly thereafter. All except 6 patients were hospitalized for treatment. The 6 patients treated as ambulatory responded just as well as the hospitalized patients. Only one failure (V. H. D., patient 13) occurred out of 16 treated. This patient was promptly cured after she received eight doses of penicillin, 10,000 units every three hours. No toxic symptoms were noted with penicillin.

SUMMARY

Sixteen cases of chronic gonorrheal vaginitis in children were treated with one dose of penicillin, 100,000 units injected intramuscularly. Clinical and bacteriologic cure was effected in 15 cases within three days, usually two days. The 1 remaining case required further therapy with divided doses of penicillin. Because of its safety and rapid cure penicillin is the drug of choice for the treatment of chronic gonorrheal vaginitis in children. One 100,000 unit dose of penicillin injected intramuscularly seems adequate in most cases. Hospitalization is not necessary.

EPIDURAL SPINAL ABSCESS

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The consequences of an unrecognized purulent collection in the epidural space can be so devastating that further emphasis on the clinical syndrome accompanying this lesion has ample justification. Although over 200 cases are reported in the literature and recent reviews by Gasul and Jaffe,[1] Browder and Meyers [2] and Campbell [3] have drawn attention to this condition, nevertheless the high percentage of delayed diagnoses with resulting irreversible cord damage causing severe and permanent neurologic sequelae warrant a further report. The 14 cases on which this communication is based furnish no new nor striking clinical information. But the antecedent history and development of symptoms is so uniform that repetition is justified, if only to remind the profession that this condition does exist, to describe again its salient features and thereby, perhaps, help in early diagnosis and prompt operation. For unless realization is widespread among medical men that epidural infection can and not infrequently does follow infection in other parts of the body, valuable time is lost in performing laminectomy. In consequence, the spinal cord suffers irreparable damage.

The epidural space is formed by a separation at the foramen magnum of the layers of the dura as it passes down over the spinal cord. The outer layer forms the periosteum of the laminas and bodies of the vertebrae; the inner, the dura proper surrounding the cord. Anteriorly to the cord the two layers are closely approximated, but posteriorly the dura over the cord falls away from the laminas to form the epidural space containing the epidural fat with its many veins. Dandy [4] states that the spinal epidural space is present only dorsal to the nerve attachments. Ventral to the nerve the dura is everywhere closely applied to the bones of the vertebrae and their ligaments. Below the second sacral bony segment the epidural space surrounds the dura on all sides. Of greatest importance are the variations in the size of the epidural space. In the cervical region the space is only potential, there being but a few strands of fibrous tissue and almost no fat between the laminas and the dura. The epidural space really begins to appear at the seventh cervical vertebra and gradually deepens along the thoracic vertebrae, attaining a depth of about 0.5 to 0.75 cm. between the fourth and eighth dorsal vertebrae. The space tapers again and becomes shallow between the eleventh thoracic and second lumbar vertebrae. Over the remaining lumbar and the first and second sacral vertebrae the epidural space attains its greatest depth. Consequently an epidural abscess rarely is found above the fourth thoracic. The lower thoracic and lumbar areas, where the epidural space is largest and the veins in the epidural fat most numerous, are the common sites for infection.

Hematogenous infection is much the more common cause for epidural abscess. Many blood vessels run in the epidural fat and anastomose freely with those entering along the spinal nerves. Batson [5] has shown recently that the venous anastomosis reaching into this area is more extensive than hitherto suspected. The constant repetition in the case histories of local acute infection, usually a furuncle, preceding the epidural focus and the frequency with which the staphylococcus is the organism found in both areas seems convincing evidence that the blood stream has been involved. In the 88 cases from the literature analyzed by Browder and Meyers, 72 were apparently blood borne. The staphylococcus was commonly recovered, 59 of these 72 cases having been due to this organism.

An epidural spinal abscess may be acute, subacute or chronic. If free pus is found in the epidural space without granulation tissue on the dura, the abscess is considered acute; if both free pus and dural granulations are encountered, the abscess is subacute; whereas, if a solid extradural fibrous mass without definite macroscopic evidence of infection is discovered, the abscess is undoubtedly chronic.

An epidural abscess forms as the result of an adjacent infection spreading to the epidural space or by blood borne infection from a distant focus. Direct trauma, a bullet or stab wound or a retropharyngeal or posterior mediastinal abscess are all possible causes of direct infection. Campbell reports a case originating from a furuncle of the external chest wall and 15 cm. from the operative site. Pressure over this area caused pus to well up into the laminectomy wound. Infected pilonidal cysts (Campbell, Stammers [6]) have caused epidural infection. Hunt [7] and Browder and Meyers are of the opinion that osteomyelitis of the vertebra is a constant finding. They account for the frequently recorded tenderness over the spinous processes adjacent to the abscess on this basis. Stammers reports cases in which vertebral osteomyelitis was present

Read before the Section on Nervous and Mental Diseases at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 14, 1944.

1. Gasul, B. M., and Jaffe, R. H.: Acute Epidural Spinal Abscess: A Clinical Entity, Arch. Pediat. **52**: 361-390 (May) 1935.
2. Browder, J., and Meyers, R.: Infections of the Spinal Epidural Space: An Aspect of Vertebral Osteomyelitis, Am. J. Surg. **37**: 1-26 (July) 1937.
3. Campbell, M. M.: Pyogenic Infections Within the Vertebral Canal, Bull. Neurol. Inst. New York **6**: 574-591 (Dec.) 1937.
4. Dandy, W. E.: Abscesses and Inflammatory Tumors in the Spinal Epidural Space (So-Called Pachymeningitis Externa), Arch. Surg. **13**: 477-494 (Oct.) 1926.
5. Batson, O. V.: The Function of Vertebral Veins and Their Role in the Spread of Metastasis, Ann. Surg. **112**: 138-149 (July) 1940.
6. Stammers, F. A. R.: Epidural Suppuration, Brit. J. Surg. **26**: 366-374 (Oct.) 1938.
7. Hunt, J. R.: Acute Infectious Osteomyelitis of the Spine and Acute Suppurative Perimeningitis, M. Rec. **65**: 641-650 (April 23) 1904.

accompanying epidural abscess, but McNutt [8] describes 2 instances in which osteomyelitis of the vertebrae was diagnosed by roentgenographic studies without accompanying infection of the epidural space. In reading the operative notes of the reported cases of epidural infection, mention is made but rarely of osteomyelitis of the overlying spines and laminas, although not uncommonly it is stated that pus was encountered on separating the muscles from the spinous processes. Only occasionally is reference made to softening or other changes in the bone, although such changes may not have been sufficiently extensive to attract the attention of the operator.

An epidural abscess is almost always found posteriorly to the cord. Mixter,[9] Campbell, and Browder and Meyers report cases in which the abscess lay anteriorly. This was true in 1 of our cases. Infection immediately adjacent to the vertebral bodies, as a retropharyngeal or peritonsillar abscess, may track inward, involve the body of the vertebra and enter the epidural space anteriorly. But since in this region the dura is tightly adherent to the bodies of the vertebra, the abscess is always localized. The general infection of the epidural space which is so frequently encountered when the posterior region is involved never occurs when infection appears anterior to the dura. The symptoms are less fulminating, pain is rarely severe and diagnosis may be difficult.

TABLE 1.—*Source of Infection*

Of 88 cases	72 hematogenous
Of 72 cases	59 Staphylococcus aureus

Browder and Meyers in 1937 reviewed 210 cases, of which "156 may be classified as acute, 2 as subacute and 52 as chronic forms of the disease." As just stated, Browder and Meyers found 88 cases with sufficient data to warrant analysis. In this group were 71 cases described as acute, with 43 deaths and 28 recoveries, 2 subacute cases with 2 deaths and 15 chronic cases with 12 recoveries and 3 deaths.

A review of the literature [10] since 1937 shows a total of 55 cases, to which we add 14. Of these 69 cases 44 were acute. In this group 19 patients were operated on with complete recovery of all functions, 11 were operated on and survived the operation with little or no recovery from their paralysis, 13 succumbed following surgical intervention and 1 died without operation. In 6 subacute cases there were 4 recoveries following operation with complete return of function, 1 recovery without improvement in neurologic symptoms and 1 operative fatality. The chronic group numbered 19. Ten recovered completely following laminectomy, 2 survived operation without return of function and there were 2 immediate operative fatalities. In 35 of the 44 acute cases the history states that a furuncle or other acute superficial infection immediately preceded the onset of cord symptoms.

TABLE 2.—*Review of 88 Cases Before 1937*

	Died	Recovered	Mortality
Of 71 acute	43	28	60%
Of 2 subacute	2	..	100%
Of 15 chronic	3	12	20%

It would seem, therefore, that the attention called to this condition by the reviews referred to has lowered the operative mortality rate and, more important still, increased the percentage of patients who have completely recovered from their disabilities. Without question, early diagnosis and prompt operative intervention are essential to total recovery. The delay is commonly caused by lack of appreciation that acute infection can involve the epidural space and that immediate laminectomy is indicated.

The symptoms of an epidural infection appear with an almost monotonous regularity. A careful history will show that a previous infection has existed, usually a furuncle or other skin infection. Within a week or two the patient has pain, usually very severe, in the back or down the legs. A few days after the pain appears, numbness and finally paresis, passing on to complete paralysis, develop in the legs and extend upward rather rapidly. Loss of sphincter control may appear early and be complete. As the anesthesia and paralysis develop, the pain may become less pronounced. Physical examination reveals a sick patient, usually febrile and showing a leukocytosis. Neurologic studies indicate a cord lesion, more or less complete, depending on the time at which the patient is seen and the virulence of the infection. Palpation of the spinal column frequently reveals an area of acute tenderness corresponding with the upper level of sensory change. In some cases a slight edema and swelling of the spinal muscles may be present in this area.

TABLE 3.—*Review of 69 Cases Since 1937*

	Total	Died	Recovered	Mortality	Recovered Function
Acute	44	14	30	31%	19
Subacute	6	2	4	33%	4
Chronic	19	2	17	10%	15
Total	69	18	51	26%	38

Lumbar puncture will give extremely valuable information but must be done with caution. If an epidural infection is suspected, the needle should enter the epidural space and then be aspirated. The presence of pus confirms the diagnosis. It is essential, of course, to avoid penetrating the subarachnoid space through an epidural collection. However, if lumbar puncture

8. McNutt, J. R.: Roentgen Diagnosis of Osteomyelitis of Vertebrae, Am. J. Roentgenol. **39**: 52-56 (Jan.) 1938.

9. Mixter, W. J.: A Case of Epidural Intraspinal Abscess of Metastatic Origin, Boston M. & S. J. **175**: 864 (Dec. 14) 1916.

10. Cases reported since 1937:

Gotten, N., and Simpkins, C.: A Clinical and Anatomic Study of Spinal Epidural Abscesses with Report of Two Cases, Memphis M. J. **13**: 61-65 (April) 1938.

Chinner, M. E.: Extradural Spinal Abscess Secondary to Carbuncle of Wrist, M. J. Australia **2**: 157 (Aug. 1) 1936.

Neale, A. V.: Epidural Inflammation of Spine, Birmingham M. Rev. **11**: 4-8 (March) 1936.

Mitchell, W. R. D.: Acute Epidural Abscess, Brit. M. J. **1**: 1149-1151 (May 28) 1938.

Bunch, G. H., and Madden, L. E.: Acute Epidural Abscess, South. Surgeon **8**: 291-297 (Aug.) 1939.

Weilbacher, J. O.: Acute Epidural Abscess, New Orleans M. & S. J. **92**: 208-215 (Oct.) 1939.

Echols, D. H.: Acute Epidural Abscess, ibid. **92**: 682-683 (June) 1940.

Fitch, T. S. P.: Sulfathiazole in Treatment, Arch. Pediat. **57**: 119-124 (Feb.) 1940.

Raney, R. B.: Acute (Pneumococcic) Metastatic Spinal Epidural Abscess, Bull. Los Angeles Neurol. Soc. **4**: 3135 (March) 1939.

Cohen, I.: Epidural Spinal Infections, Ann. Surg. **108**: 992-1000 (Dec.) 1938.

Boyce, S. W.: Epidural Abscess, Tri-State M. J. **14**: 2753 (Aug.) 1942.

Bodechtel, G.: Clinical Aspects of Epidural Abscess, Nervenarzt **14**: 337-343 (Aug.) 1941.

Boharas, S., and Koskoff, Y. D.: Early Diagnosis of Acute Epidural Abscess, J. A. M. A. **117**: 1085-1088 (Sept. 27) 1941.

Echols, D. H.: Emergency Laminectomy for Acute Epidural Abscess: Four Cases with Recovery in Three, Surgery **10**: 287-295 (Aug.) 1941.

Bailey, A. A., and Love, J. G.: Epidural Abscess of Spinal Cord: Two Cases, Proc. Staff Meet., Mayo Clin. **16**: 24-28 (Jan. 8) 1941.

Browder, J., and Meyers, R.: Pyogenic Infections of Spinal Epidural Space, Surgery **10**: 296-308 (Aug.) 1941.

is carried out in a routine fashion a partial or complete block will be evident with increased protein, possibly xanthrochromia and a slight polymorphonuclear pleocytosis in the fluid. This evidence from the Queckenstedt test of a mass lesion within the vertebral canal eliminates the possibility that the apparent transverse myelitis is due to intrinsic cord disease. Operative intervention at the proper level indicated by the sensory change is urgently indicated. If laminectomy reveals pus, the wound should be packed open after adequate drainage has been assured. The sulfonamide derivatives may be used in powdered form in the wound as well as by mouth. Curiously enough, Reeves[11] in a recent paper reports the first case of acute epidural abscess in which they were employed. His patient recovered.

The cause for the transverse myelitis in the acute cases apparently is a degeneration in the spinal cord due not so much to pressure as to circulatory stagnation. The abscess is seemingly too widespread and diffuse to bring about destruction of the cord by direct pressure, and irreversible damage is too quickly produced to be due to this factor alone. Rather an obstruction of the venous plexuses of the epidural space, meninges, and in the cord itself occurs, due to irritative and inflammatory processes. A stagnation edema appears, causing distention of tissue spaces, and the adjacent neural fibers are affected by compression.

TABLE 4.—*History of Infection*

1. Severe pain in back
2. Painful spinous process
3. Neurologic signs progressive
4. Spinal block

A chronic epidural abscess is often indistinguishable from an extradural spinal cord lesion, both in the development of symptoms and grossly at operation. In many of the cases reported in the literature and in all of the 5 chronic cases in the present series the clinical diagnosis was presumably that of a fibrosarcoma. The majority of these chronic epidural granulomas invade the dura, and either sharp dissection is necessary to separate the dura from the tumor, or the tumor and the invaded dura must be removed in one mass. The prognosis not only for immediate operative recovery but also for ultimate return of function is much better in the chronic than in the acute cases. The slower development of compression symptoms and the absence of widespread interference with the blood supply of the cord and of virulent toxic material in the epidural space result in less serious damage to the neural structures.

In this small series of 14 cases 6 were acute, 3 subacute and 5 of the chronic type of abscess. All the patients were operated on. Of the 6 patients with acute abscess, 2 died following laminectomy and 4 recovered, 2 with serious neurologic sequelae. Two patients with acute epidural abscess recovered function completely as the result of a prompt decompression and drainage. All with subacute abscess survived operation and 2 had satisfactory restoration of function. Of the 5 with chronic abscess 1 died following operation and, of the 4 survivors, but 1 had complete return of power in the legs with adequate sphincteric control.

3400 Spruce Street.

11. Reeves, D. L.: Acute Metastatic Spinal Epidural Abscess: Report of Two Cases with Recovery Following Laminectomy, Arch. Surg. **41**: 994-1003 (Oct.) 1940.

ABSTRACT OF DISCUSSION

DR. ADRIEN HENRI VERBRUGGHEN, Chicago: I have not seen a case of this kind since 1937, so it must be becoming a rarity around here. Two of the cases that I had were due to a cause which Dr. Grant did not mention. Both of them were due to attempts to include spinal anesthesia, evidently due to some infection of the skin or in the presence of infection somewhere in the deep tissues. One was an attempt to produce continuous extradural spinal anesthesia; the other was secondary to an ordinary straightforward spinal anesthetic. The prognosis, as Dr. Grant mentions, is quite poor; of the 6 patients with whom I have had some experience 2 died. They were all operated on. Two died following operation, 2 of them remained completely paraplegic following operation and 2 of them had some return of function with bladder control but weakness and spasticity in the legs. It seems likely that we shall see less and less of this condition and not more and more of it, for it seems to be one for which penicillin was invented. If it is recognized early, and possibly large doses of penicillin are given before paraplegia results, it may not be necessary to perform a laminectomy.

DR. A. W. ADSON, Rochester, Minn.: In reviewing the records of cases of pyogenic infection of the spinal extradural space at the Mayo Clinic, I found that we had operated in 12 such cases. The review consisted of an analysis of etiologic factors, symptoms and operative results. Our findings corroborate the observations made by Dr. Grant. Six of the patients were men and 6 were women. The patients were young adults, with one exception—a man of 60. In 4 cases the infection was the result of recurring osteomyelitis. In 2 cases it was due to a diffuse furunculosis; in 1 it was due to a large carbuncle on the neck. In 2 the lesion developed subsequent to a paranephric abscess, and in another case it followed an empyema and a mediastinal infection. In 1 case it developed following trauma to a lumbar vertebra and disk. In the twelfth case we were unable to determine the etiologic factor. The general symptoms were those of a chronic systemic pyemia. The temperature elevations were rarely more than a degree or two. The leukocyte count usually averaged 9,000 to 10,900 per cubic millimeter. The pus contained Staphylococcus aureus; however, it was sterile in 3 cases. In only 2 cases was there roentgenographic evidence of bony destruction. The characteristic local symptoms were those of a transverse myelitis without the signs of a diffuse meningitis. Spinal punctures were avoided. The progress of symptoms was fairly rapid; the symptoms developed within twenty-four to seventy-two hours. In only 3 of the 12 cases did a complete transverse myelitis develop. No recovery was obtained by drainage of the abscess in these 3 cases. Nine patients had partial paralysis. In some instances the motor loss was in excess of the sensory loss, and in others the reverse was true. The results of surgical drainage were successful in 5 cases since complete recovery of function occurred. In the remaining 4 cases only a partial recovery occurred. There were no surgical deaths. The patient with empyema died at home several months after operation. An early diagnosis is imperative, and surgical drainage should be instituted before the signs of a complete transverse myelitis have developed. If the extradural spinal abscess is drained without injury to the dura before extensive paralysis is present the prognosis is reasonably good.

DR. GEORGE B. HASSIN, Chicago: In 1 of our cases there was an abscess above the dorsal surface of the dura. There were no signs of pressure on or compression of the spinal cord. The size and configuration of the latter were preserved but the various tracts showed scattered areas of rarefaction. The dura underneath the abscess was thickened, hyperplastic and separated from the subjacent arachnoid by a widened subdural space. The ventral portion of the dura, in contrast, was normal. In addition the perineurial spaces—over the spinal roots—were obliterated. Because of the obliteration of these spaces, which was caused by adhesions between the roots and the subarachnoid spinal membrane, the flow of the cerebrospinal fluid from the subarachnoid space along the spinal roots was interfered with and the tissue fluids of the spinal cord therefore could not be discharged. They become stagnant, causing the rarefaction. The perineurial space obstruction and not the compression of the spinal cord—as assumed by the neurosurgeons and in general—is responsible for the clinical picture of an epidural abscess,

such as root pains, paraplegia and sensory and genitourinary disturbances. As emphasized by Dr. Grant, the clinical picture should be recognized as early as possible and the abscess removed, thus preventing the occurrence of the changes in the roots and spinal cord as demonstrated.

DR. FRANCIS C. GRANT, Philadelphia: I brought up the subject of epidural spinal abscess and have again described the clinical syndrome connected with this lesion in the hope that earlier recognition might follow. As Dr. Hassin has said, if these patients are permitted to become paraplegic the results following surgery are far from satisfactory. Dr. Verbrugghen suggests that the use of penicillin or the sulfonamide derivatives might avoid the necessity for operation. I am sure that he made this suggestion so that I could protest strenuously against it. Any delay in these cases is dangerous. Immediate operation is indicated as soon as the diagnosis is reached. To wait twenty-four to forty-eight hours to determine the effect of either or both of these drugs can easily result in permanent cord damage. The clinical picture of severe pain in the back, then sudden onset of signs of spinal cord involvement, plus a partial or complete block on Queckenstedt test, forms a triad of symptoms demanding immediate surgical exploration.

Clinical Notes, Suggestions and New Instruments

MALARIA AND THE RETURNING SOLDIER

S. B. OSGOOD, M.D., GRANTS PASS, ORE.
Health Officer, Josephine County Health Department

More than a year ago Coggeshall [1] pointed out the possibilities of the spread of malaria in wartime to civilians. As far as I can determine, the periodical literature for the past two years has contained very few references to the occurrence of malaria cases in new areas or an increase in prevalence of malaria in endemic areas since the war. Jeffries [2] reported 1 case of estivoautumnal malaria occurring in a merchant seaman who returned to Oregon. However, there had been no report of any secondary cases arising. My purpose in the present discussion is to report 2 cases of tertian malaria and the evidence from which I conclude that a returned soldier was the source:

CASE 1.—R. C., a white girl aged 12 years, a student, was seen in the office on Aug. 5, 1944 complaining of chills and fever of one week's duration. Since the child was obviously acutely ill (temperature 104.4 F. by mouth), she was referred to a private physician for further examination and treatment. In view of the history of chills and fever, it was thought advisable to secure a blood culture for undulant fever, together with thick and thin blood films for malaria. Her blood films were examined in my office, in the laboratory of the Josephine General Hospital and in the Oregon State Hygienic Laboratory. The presence of Plasmodium vivax in these films was confirmed independently by each laboratory. The cultures for undulant fever were subsequently reported negative. Quinine therapy was instituted by the attending physician the same day. The patient has remained free from chills and fever since that time. Epidemiologic investigation the following day revealed that the patient had felt perfectly well until July 30, at which time a sharp chill, followed by rise in temperature, occurred. The patient felt well and was able to be up and about on July 31 but was again taken with a severe chill about noon on August 1. Severe shaking chills had occurred again on the 3d and the 5th almost exactly forty-eight hours apart. The patient's household consisted of her mother, the grandparents, a sister and an infant cousin, all of whom were well and had been so for the preceding sixty days. A great-uncle (T. M.) had lived in a tent approximately 50 feet from the patient's house for more than two weeks immediately prior to the illness. Relatives volunteered the information that the uncle had been discharged from the United States Army in February 1944 with chronic malaria after having served in the South Pacific area from March 1942 to November 1943. Effort was made to get in touch with him, but his whereabouts were unknown as he was in another county looking for work.

The patient had lived in the same area of Josephine County for her entire life and had never left the county for even a short period. There had been other visitors in the household, but as far as could be determined no one else had been ill among the household or near neighbors. Neither had any cases of malaria been reported from this county for ten years,[3] with the exception of 2 exogenous cases whose sources were known, and the patients had never lived in the neighborhood.

The patient's residence was a one story frame building only partially completed, in which several of the window panes were missing and which was entirely unscreened. The house was located approximately 50 feet from the edge of Grave Creek. Mosquitoes were abundant in the residence of the patient at the time of the investigation on August 6. Mosquito specimens were collected from the residence of the patient. These were identified as Anopheles punctipennis and Culex tarsalis by Ernest C. Anderson, assistant entomologist, U. S. P. H. S., of Oregon State College.

CASE 2.—Mrs. E. A., aged 44, white, was seen in my office on Sept. 12, 1944 with a history of chills and fever since September 4. Questioning revealed that the chills and fever had occurred every other day since the onset and that the patient's residence was less than a quarter of a mile from that of patient 1. Blood films for malaria were taken and examined in my own laboratory, the laboratory of the Josephine General Hospital and the Oregon State Hygienic Laboratory, all of which reported the finding of Plasmodium vivax. The patient was referred to a private physician for treatment and was placed on quinine therapy. No further attacks of chills or fever have occurred since that time.

Epidemiologic investigation revealed that the household of Mrs. E. A. consisted of herself and her husband. Their home was located on the opposite side of Grave Creek approximately 400 feet downstream from the residence of patient 1. The residence was a one story frame building which had not yet been completed and in which many of the window panes were missing. It was entirely unscreened.

History revealed that the great-uncle, T. M., of the previous patient passed the house very frequently and that his home was well within flight range of anophelines. The patient had not been out of the county for several months and had had no visitors except those from the immediate neighborhood. Unfortunately, on the day of investigation of this case (September 13) the weather was rather cold and no mosquitoes could be found in the house. The patient and her husband said that the mosquitoes had been very numerous during the preceding months and agreed to collect specimens in the house at their earliest opportunity. On September 15 the husband brought in a collection of 7 specimens which were trapped in his house, and these were forwarded to Mr. Ernest C. Anderson, assistant entomologist, U. S. P. H. S., of Oregon State College, who reported that 6 of the 7 specimens were Anopheles maculipennis freeborni—the common malaria vector in Oregon.

After repeated efforts to locate the great-uncle of patient 1 he was finally seen at home on November 1. At this time he gave the history of serving in the South Pacific area from March 1942 to November 1943, having first developed clinical malaria in Townsville, Australia, in October 1943. He was treated intermittently for clinical attacks of the disease from that time until his discharge from the United States Army on Feb. 16, 1944 at McCaw General Hospital, Walla Walla, Wash.

Since his army discharge he had spent most of the time at the home of his mother on Grave Creek. This residence is

Through his alertness, Dr. M. E. Corthell of Grants Pass made possible the diagnosis of the first case within two hours. Dr. A. J. Fawcett of Glendale, Ore., confirmed the fact of preexisting malaria in the source case. Mr. Ernest C. Anderson of Oregon State College, Corvallis, Ore., identified the mosquitoes collected from the homes of the patients.

1. Coggeshall, L. T.: Malaria as a World Menace, J. A. M. A. **122**: 8 (May 1) 1943.

2. Jeffries, B.: Wartime Malaria in Oregon, Northwest Med. **42**: 285 (Oct.) 1943.

3. Official records of Josephine County Health Department, Grants Pass, Ore., further substantiated by search of communicable disease reports in the files of the Oregon State Board of Health.

located on the north side of Grave Creek immediately opposite the residence of the second patient and approximately 400 feet downstream from the residence of the first patient.

During the latter part of July and first part of August he lived in a tent adjoining the residence of the first patient and was frequently bitten by mosquitoes. During this period he was living with a logging partner, C. C. I have been unable to locate this man, as he returned to Texas before the investigation revealed that he was a contact. However, I am informed by the husband of the second patient that C. C. suffered from chills and fever during the last part of his stay on Grave Creek.

Mr. T. M. states that he had several attacks of chills and fever during the summer of 1944 and was quickly relieved of one severe attack, which occurred on or about August 1, by the administration of quinine obtained from Dr. A. J. Fawcett of Glendale, Ore. Correspondence with Dr. Fawcett reveals that Mr. T. M. was seen by him on or about August 1, and the clinical diagnosis of malaria was made, although no blood films were taken.

Mr. T. M. states that he entered the United States Veterans Hospital in Portland, Ore., on or about Oct. 15, 1944 for a check-up leading to a disability claim, that he was told by the attending physician at the hospital that he had chronic malaria, and that he was given a quantity of atabrine. The patient was therefore requested to come to my office for further examination.

He was seen in my office on November 18, at which time blood films were taken and submitted to the Oregon State Hygienic Laboratory and to the laboratory of the Josephine General Hospital, as well as being examined in my office. All three laboratories found Plasmodium vivax present in abundance in the blood films on this date.

It is interesting to note that no cases of malaria occurred in the house of T. M.'s mother, where he spent most of the summer. It seems probable that this was due to the fact that his mother's house was completely screened.

CONCLUSION

Two proved cases of malaria, and possibly a third, were contracted from a returned soldier having chronic malaria. This occurred in a rural area which had been entirely free of this disease as far back as official medical records are available. The existence of anopheline vectors of malaria had not even been suspected prior to the occurrence of these cases. It would appear that careful mosquito surveys must be made in this and other districts where climatic conditions permit the existence of anopheline vectors, and that active mosquito control measures must be instituted if an increased incidence of malaria and its establishment in new endemic areas is to be prevented.

NEPHROSIS PROBABLY DUE TO EXCESSIVE USE OF STA-WAY INSECT REPELLENT

DAVID HOEHN, M.D., PALMER, ALASKA

A white boy aged 3 years was admitted to the hospital on Aug. 4, 1944, acutely ill with generalized edema. The swelling was most noticeable in the lower extremities, and the scrotum was about the size of a large grapefruit.

Urinalysis showed pus, albumin and no casts. A diagnosis of pyelonephritis or nephrosis was made on admission.

During the next few days the swelling decreased and the boy's general condition improved. However, a week later he had more edema, and three weeks after admission the edema became very pronounced again. At that time he was seen in consultation by Capt. H. A. Zimmerman, M. C., whose diagnosis was that of nephrosis.

I tried to elicit some information that might give a clue as to the source of the kidney damage. The child had always been well, and the fact that he was taken seriously ill so suddenly made me think that he might have ingested some toxic substance which caused the kidney damage. The father being a truck gardener, I thought the child might have eaten some of the poisons which are used to destroy insects. But the father insisted that he never kept any poisons around the place because of the child. I told the parents to keep thinking of something the child had done which might be harmful to him.

The mother received information from a friend that the insect repellent Sta-way had been banned for use in the Army because it might be harmful. She brought this information to me and admitted that they had used Sta-way very freely on the child's skin during the summer. The child was dressed in a play suit which covered only a small part of his body, and the exposed surface was liberally greased with the insect repellent. Early in the summer the boy developed a generalized skin rash, but the parents thought nothing of it and continued using the repellent in generous quantities. If the parents had discontinued the Sta-way when the rash appeared, probably no kidney damage would have resulted. The consulting physician and I both feel that this substance was the cause of nephrosis. I decided to investigate.

The physicians in a nearby army hospital were interested in this case and Lieut. Col. C. E. Albrecht, M. C., corresponded with Mr. H. H. Stage of the Bureau of Entomology and Plant Quarantine of the U. S. Department of Agriculture. He asked us to mail some Sta-way for toxic tests. Since the father had purchased two cases of Sta-way in the summer of 1943 there was still some of the substance available. It came from the same case that had been used on the little boy. To show how freely this substance was used, for a family of four only three bottles were left out of the two cases.

Tests done by the Committee on Medical Research and the Office of Scientific Research and Development showed that Sta-way is a severe kidney and liver poison to rabbits. Results of the test would indicate that Sta-way could be the cause of nephrosis in this child.

In September 1944 the child became much worse, and about the middle of the month his condition became extreme and it looked as though he would not live more than a few days. He was given plasma at the suggestion of Capt. H. T. Knoblock, M. C., and his condition improved. Four infusions of plasma (250 cc.) and two transfusions of whole blood were given. Although the edema did not clear up completely, we were not able to find any more patent veins to use and decided to abandon transfusing for a time. Possibly marrow puncture could have been used, but we were reluctant to do it, not having had any experience and not knowing how it would work in so small a patient.

For some time the boy was unable to void urine and great difficulty was experienced because of the long prepuce, which became very edematous and made it almost impossible to reach the urethra. On October 1 his condition improved so that we were able to do a circumcision, and this made his care considerably easier, although he was still quite edematous.

One point of interest was the formation of an ulcer in the boy's right inguinal area about October 15 which was very difficult to heal. Doubtless this was due to a thrombosed vessel. Onion vapor treatment was used with considerable success.

At the present time the child is in fairly good condition. The edema is almost all gone, he is fairly active and he eats well. Undoubtedly his life expectancy has been considerably shortened, and the danger of recurrence of the disease is imminent.

My purpose in this paper is not to give the treatment for nephrosis but rather to show the possibility of danger from the unrestricted use of this insect repellent, which has been very popular in Alaska. The Federal Food, Drug and Cosmetic Act does not cover insect repellents and therefore the Food and Drug Administration does not have any jurisdiction over this type of product. It seems that there should be some type of restriction so that indiscriminate use would be warned against. Proper legislation would enable the Food and Drug Administration to have administration over repellents so that such incidents would not be repeated. If the people were warned not to use the substance freely, and especially not to use it in the presence of a skin rash, I believe such unfortunate occurrences could be prevented.

Council on Physical Medicine

The Council on Physical Medicine has authorized publication of the following report. HOWARD A. CARTER, *Secretary.*

MEETING OF THE COUNCIL ON PHYSICAL MEDICINE

Abstract of Minutes

The twentieth annual meeting of the Council on Physical Medicine (formerly the Council on Physical Therapy) was held in Chicago on February 11 and 12. Those present were John S. Coulter, Chairman, Frank H. Krusen, Vice Chairman, Morris A. Bowie, Eben J. Carey, Anthony C. Cipollaro, A. U. Desjardins, W. E. Garrey, George Morris Piersol, H. B. Williams, Frank R. Ober and Howard A. Carter, Secretary.

Dr. John S. Coulter was reelected Chairman and Dr. Frank H. Krusen was elected Vice Chairman, replacing Dr. W. E. Garrey, who resigned at his own request.

A report on methods commonly used in artificial respiration, prepared by Dr. Bernard Ross, was presented for the Council's consideration. His report covers a five year survey of artificial respiration in emergency applications. The survey was supported by a grant in aid of research awarded by the Council. The report confirmed the Council's previous findings.

The Council decided to devote more time to the consideration of products containing radium and radon.

The assignment of frequency channels recommended by the Federal Communications Commission for use by diathermy apparatus was given consideration. The Council voted that in the interests of the public it desires to support the stand of the Federal Communications Commission and that it does not care to be in opposition to the federal agency which is responsible for this important decision.

War casualties have intensified the employment of occupational therapy. In view of the important problems currently arising in this field, the Council appointed a group of consultants. Those appointed were Dr. Winfred Overholser, Chairman, Dr. Raymond Allen, Col. Howard A. Rusk (MC), Dr. William Stroud and Dr. Francis Trudeau.

The Council also decided to revise the film on occupational therapy which will be made available for distribution or loan.

The Council was gratified with the progress being made by the Consultants on Audiometers and Hearing Aids. Drs. Gordon Berry and Moses H. Lurie were appointed to serve as members of this group of consultants.

A report by Dr. Thomas D. Allen for the Consultants on Ophthalmic Devices was accepted with enthusiasm and the Council realized that "orthoptics" might well be given more intensive consideration and study.

The Consultants on Contraceptives reported that they had had two meetings during the year and had defined their functions as follows:

1. To formulate minimum requirements or rules for the acceptance of contraceptive devices; and

2. To pass on evidence as to the effectiveness and dangers of such devices, making recommendations to the Council on Physical Medicine on which the Council may base its decision as to acceptance of such devices.

The Council voted to appoint a group of Consultants on Electroencephalography to assist in the investigation of electroencephalographs.

Considerable discussion was devoted to the role the Council will play in establishing a Section on Physical Medicine and a separate Board of Physical Medicine. At the present time physical medicine is regarded as coming under the American Board of Internal Medicine.

The Council voted to furnish gratuitously the booklet "Apparatus Accepted" to all junior students in schools of medicine. The third year is generally considered the term during which physical medicine is studied in medical colleges.

Considerable discussion was devoted to the responsibility of medical schools in teaching physical therapy and also to the entrance requirements for students studying to be physical therapy technicians. Teaching and entrance requirements of occupational therapy schools for technicians was also discussed. The revision of films on physical therapeutic subjects available through the Bureau of Exhibits was considered. The slides which have been prepared by the Council for teaching and lecturing purposes appear to be a good investment. A set of these slides may be loaned free of charge to qualified persons by writing to the Secretary, the borrower paying the express charges one way.

After due consideration, the Council reaffirmed its decision of several years' standing against the use in accepted advertising of the term "sunshine vitamin" when referring to vitamin D. The Council further reaffirmed its stand not to permit the word "Doctor" or its abbreviation as part of the name of an accepted product.

The Council adopted a list of devices which it considers as coming under its purview.

RADIAIRE (RAD-I-AIR) WITHDRAWAL OF ACCEPTANCE

Manufacturer: Tru Ad Company, 1019-1023 North Madison Avenue, Los Angeles.

The Radiaire ultraviolet disinfecting lamps were accepted and the report appeared in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, Dec. 11, 1943. These lamps were accepted for installation in hospital operating rooms, wards and nurseries. When considering the aforementioned lamps the Council had evidence that, under properly controlled conditions, the killing of air borne micro-organisms by ultraviolet rays may be used to supplement ordinary methods of disinfecting air for the prevention of cross infections in the aforementioned installations. Routine sanitary procedures in operating rooms, hospital wards and nurseries augmented by radiation from ultraviolet disinfecting lamps, the Council believes, will be an added precaution, but the Council does not regard these lamps a substitute for the orthodox disinfecting procedures which are accomplished by cleaning, scrubbing and the use of face masks and clean wearing apparel.

Since the acceptance of the Radiaire, the Tru Ad Company, a manufacturer of neon signs, organized a division of the parent firm and called it the Tru-Air Ultraviolet Products Company, 2151 Wilshire Boulevard, Los Angeles, California. This firm changed the name of the product to Rad-i-Air. Although there is a difference in spelling, phonetically the two sound alike.

A yellowish orange folder "Rad-i-Air Conditioner" has come to the attention of the Council. This folder contains claims that are unacceptable to the Council. According to the folder, Rad-i-Air is promoted for uses the Council does not accept, such as in factories, business offices, doctors' and dentists' offices, school rooms and home nurseries. As a matter of fact, the firm gives fifty-two recommended applications, beginning with "assembly halls" and ending with "waiting rooms," in which Rad-i-Air is promoted as valuable for preventing cross infection. In the list "hospitals" is the only installation the Council accepts. Throughout this folder there are unwarranted and misleading statements concerning the effectiveness of the lamps.

The Council is also in receipt of a purple pamphlet which the firm states has been withdrawn from circulation, although copies continue to come occasionally to the office of the secretary. This pamphlet contains unwarranted and misleading statements together with a list of industries in which the lamps are recommended for use, as for example the baking, meat, beverage, dairy and farming industries.

The Council does not accept ultraviolet lamps for disinfecting air in schools, waiting rooms, industrial plants, barracks, assembly halls or refrigerators. Evidence now available does not indicate that the incidence of colds can be reduced by the installation of ultraviolet lamps or by the irradiation of an enclosure occupied by people. Satisfactory evidence is not available to warrant acceptance of ultraviolet lamps by the Council for disinfecting solids.

In view of the unacceptable advertising the Council voted that the Rad-i-Air, formerly called Radiaire, manufactured by the Tru-Air Ultraviolet Products Company, a division of the Tru-Ad Company of Los Angeles, be withdrawn from the Council's list of accepted devices.

Council on Pharmacy and Chemistry

The Council has authorized publication of the following statement.

AUSTIN SMITH, M.D., *Secretary.*

STATUS OF COSMETICS CONTAINING HORMONES

Today cosmetic preparations are advertised to the general public with the claim that they produce favorable changes in the human skin rather than merely alter its appearance. The advertising claims that the use of such cosmetics will remove wrinkles, make the skin more soft and pleasant to observe and change older looking persons to younger appearing, attractive and even glamorous people.

Some promoters incorporate hormones, such as estrogenic hormones. Others use impressive statements about lanolin, carbamide or some so-called special stimulating factor. The end result, regardless of the product and the sales approach, is the same—a useless outlay of considerable sums of money by purchasers who still believe in the development of "miracle" compounds that can be used safely with the assurance that their hopes for beauty and health will be fulfilled.

The public is now offered preparations containing ingredients as potent as hormones, without evaluation by any unbiased body. If the cosmetic preparations containing hormones will do all that is claimed for them, they must contain potent agents. Why, then, do none stand accepted by the Council on Pharmacy and Chemistry for inclusion in New and Nonofficial Remedies? Any compound promoted to affect the structure or function of a part of the body such as the skin should be carefully evaluated before it is released for general sale.

Much experimental work has been done on the cancer-producing properties of estrogenic substances. In susceptible animals the administration of estrogens has apparently produced carcinoma, but further observations are necessary to determine all possible effects of long continued use of such substances in the average human being. Some authorities believe that the injudicious use of estrogen-containing cosmetic preparations may permit sufficient absorption from the skin to upset normal body activities. For example, it has been argued that changes in menstrual rhythm may occur because of the absorbed estrogen affecting the activity of the pituitary gland.

Enormous sums of money are being spent to purchase hormone-containing preparations and yet many authorities in the field of endocrinology have stated time after time that there is no satisfactory evidence which would justify the use of hormone-containing cosmetics for their local effects on the skin. More than one authority has questioned the honesty of manufacturers when claims have been made that the promoted preparations would counteract age changes, wrinkles and skin blemishes.

Authorities in the field of endocrinology have stated that there is no published and acceptable evidence that age changes and wrinkling are consequences of estrogen deficiency or that estrogen therapy in women who are known to be deficient in ovarian secretion produces changes in the skin; nor is the deficiency of ovarian activity to be compared in importance with skin changes due to exposure, lack of care, malnutrition and many systemic diseases.

The physician who is asked to give advice to his patients concerning the use of cosmetic preparations containing hormones will ask: What are the local effects, the general effects, and what may follow long continued use? Satisfactory data to support the answers offered by the promoters have not been provided.

Frequently there has been suggested the need for carefully controlled studies when potentially active preparations are placed in commerce. Those who have kept in mind the importance of such studies have developed criteria for their guidance. However, when the scientific literature is searched for evidence concerning the studies made prior to the commercial distribution of cosmetics containing hormones and other substances, for that matter, the lack of convincing data is significant.

The prevention and treatment of disease and allied subjects are fields in which conjectural reasoning must give way to demonstrable facts. All new drugs should be studied in the laboratory and the clinic. The Council on Pharmacy and Chemistry in its consideration of new drugs asks for evidence of safety and for evidence to support the claims. Such evidence should be available for all who are urged to use a drug or other special preparation or to comment on its efficacy. Similarly, scientific facts concerning hormone-containing cosmetics should be generally available. Certainly the Council has not received satisfactory evidence on absorption, sensitivity, systemic effects, local beneficial effect, toxicity, relation of age, physical factors such as illness, and other factors. Until these and other studies have been completed, made public and found reproducible by unbiased investigators, there can be little honest reason to indulge in the promiscuous sale of hormone-containing cosmetics. Perhaps lack of such evidence is one of the reasons why promoters have not presented their preparations for Council consideration. Can financial gain be dominating humanitarian interests? If this is true, then there is no excuse for the widespread use of hormone-containing cosmetics.

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

AUSTIN SMITH, M.D., *Secretary.*

SULFADIAZINE (See New and Nonofficial Remedies, 1944, p. 178).

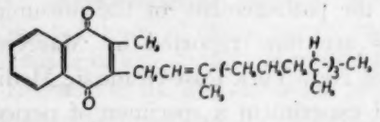
The following dosage form has been accepted:

ELI LILLY & CO., INDIANAPOLIS

Tablets Sulfadiazine: 0.065 Gm. and 0.5 Gm.

VITAMIN K_1.—2-Methyl-3-Phytyl-1,4-Naphthoquinone.—$C_{31}H_{46}O_2$ (M. W. 450.68).

Vitamin K_1 has the following structural formula:



It may be isolated from natural sources or prepared by condensing 2-methyl-1, 4-naphthoquinone with the suitable phytyl derivative.

Actions and Uses.—See the general article Vitamin K. It has been suggested that vitamin K_1 has a more prolonged effect than menadione.

Dosage.—From 4 mg. to 10 mg. by mouth, with or without bile salts. Intravenous dose for adults may be as much as 10 mg. dispensed in dextrose solution. For newborn infants a dose of 0.25 mg. may be administered intravenously.

Tests and Standards.—

Vitamin K_1 occurs as a yellow, very viscous, nearly odorless liquid of specific gravity about 0.967 and refractive index of 1.5250 at 25 C. It is stable in air but decomposes in sunlight. It is insoluble in water; soluble in alcohol, benzene, chloroform, ether and vegetable oils.

Suspend one drop of vitamin K_1 in 10 cc. of methanol, add 0.5 cc. 6 N methanolic potassium hydroxide solution and shake. A deep purple color appears immediately, which slowly turns to reddish blue and finally to reddish brown.

Suspend about 0.5 Gm. of vitamin K_1 in 10 cc. of methanol, add a freshly prepared solution of 0.75 Gm. sodium hydrosulfite ($Na_2S_2O_4$) dissolved in 2 cc. of warm water and shake vigorously for a few minutes. The oily vitamin K_1 dissolves and a reddish purple color forms which soon disappears and the mixture becomes colorless. Dilute with water, extract twice with peroxide-free ether and evaporate the ether extract under nitrogen or under vacuum: the white dihydro derivative obtained melts at 88-90 C. This dihydro derivative is readily oxidizable in air. Add one drop of vitamin K_1 to a mixture of 1 cc. of concentrated ammonium hydroxide and 1 cc. of ethanol and then add one drop of ethylcyanoacetate: no purple color is produced *(absence of menadione)*. A solution of one part vitamin K_1 and 20 parts ethanol is neutral to litmus.

MERCK & CO., INC., RAHWAY, N. J.

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THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, JUNE 16, 1945

EXPERIMENTAL RHEUMATIC ENDOCARDITIS

In 1935 Schlesinger[1] found that deposits obtained by high speed centrifugation of pericardial fluids from cases of acute rheumatism contain minute bodies which in their size and shape resemble virus particles. Relatively pure suspensions of these particles were agglutinated by serums from acute rheumatic patients. They were not agglutinated by normal human serum or by the serum of patients suffering from nonrheumatic disease. Schlesinger did not challenge prevailing belief in the importance of hemolytic streptococci in acute rheumatic infections. He concluded that streptococcic infections lower normal resistance to the rheumatic cardiotropic virus or otherwise activate this virus.

Tests of the pathogenicity of the presumptive rheumatic virus are now reported by MacNeal and his associates[2] of New York Post-Graduate Medical School. In a typical experiment a specimen of pericardial fluid from a patient who had died of acute rheumatic carditis was passed through a Mandel filter. The bacteriologically sterile filtrate thus obtained was injected intravenously into a series of rabbits. The animals were killed at various intervals after the injection. Necropsies revealed scattered foci of inflammation in the myocardium, in one or more valves of the heart and in the pulmonary arterioles. The changes in the heart valves could be distinguished from those in experimental bacterial endocarditis by the absence of bacteria, the more diffuse dissemination of the lesions, their curious edematous verrucous character and particularly the accompanying hyperplastic and reparative activity of the endothelium and connective tissue. The experimental verrucous endocarditis thus produced was ordinarily not fatal.

The disease has been propagated in series through fifteen successive groups of rabbits by blood transfer. The causative agent has been propagated in a series in embryonated eggs. Allantoic fluid from such eggs injected intravenously produces even more pronounced lesions of the rabbit heart than the original pericardial exudate. This is presumably due to greater concentration of the virus. Numerous control injections have been made in rabbits injected intravenously with normal human blood, normal allantoic fluid, vaccinia virus, Theiler virus, influenza virus and similar substances. Such injection has not produced cardiac lesions identical with those following injection of the "rheumatic" virus.

MacNeal does not draw a conclusion from these data as to the probable relation of the virus to acute rheumatic disease. He merely reports his results as exemplifying the type of virus research that will be necessary before the presumably complex etiology of rheumatic infection can be determined.

1. Schlesinger, Bernard; Signy, A. G., and Amies, C. R.: Lancet **1**: 1145 (May 18) 1935.
2. MacNeal, Ward J.; Blevins, Anne; Slavkin, Alice E., and Scanlon, Helen: Science **101**: 415 (April 20) 1945.

SOME MALINGERERS COME HOME

Following World War I many a young man mentally disturbed by the trials and tribulations of military service appeared in the offices of physicians throughout the nation with symptoms that indicated loss of vision or of hearing or of locomotion or other activities of the body. The public dismissed these incidents in most cases with the trite appellation of "shell shock." This time they only shrug their shoulders and say "NP." One such soldier at the end of World War I, presumably blind, claimed to have recovered his sight through a single manipulation by an osteopath. Innumerable cases of loss of hearing recovered following something called the airplane treatment of deafness; they were taken 6,000 or 8,000 feet in the air; the airplane was permitted to make a sudden descent; when the passenger dismounted, he had recovered his hearing.

Apparently many people forget that there is such a thing as the power of suggestion which may strangely influence the sensations and activities of the human body. Many physicians lose sight of the diagnosis of hysterical paralysis. A recent instance concerns a young man who enlisted in the Marine Reserves late in 1943. After two or three months some hearing tests were made. When he missed some of the words he was sent to a physician. The physician told him that he would be totally deaf within one year. He was discharged from the Marine Reserves because of deafness. He was given attention by this physician over a considerable period and apparently recovered his hearing by the use of a bone conduction instrument strapped to his wrist. Indeed, he reported that he had been exhibited at a meeting of the New York Academy of Medicine, Section on Otolaryngology, as a remarkable case. Finally, he was tested recently with the apparatus known as the "lie detector," which indicated his ability

as a prevaricator. His hearing has been perfect ever since the experience with the lie detector.

The incident is here cited merely as another warning to the medical profession of the possible increase in malingering likely to appear with the discharge of many millions of men from military service.

ARTERIOSCLEROSIS

The vascular disorders grouped under the name of arteriosclerosis are becoming increasingly more important from the medical, social and economic point of view as a result of the growing proportion of older people in the population. In addition, the increasing concentration of the population in urban industrial areas has led to greater contact with factors which tend to promote this condition. Hueper [1] has published recently a series of papers reviewing this subject. As arteriosclerosis seemed to be a natural sequence of aging, senescence was early looked on as a causative factor in this condition, a view which, according to Heuper, was responsible for the stagnation in its investigation. This theory has been discarded by most investigators, since appreciable arteriosclerosis is not a constant phenomenon of old age. For any age group definite relation between the degree and distribution of senile vascular changes and arteriosclerotic changes has not been established. A toxin theory has also been proposed; in addition to bacterial toxins many substances of chemical nature, such as tyramine and digitalis, may exert direct toxic effects on the vascular walls.

A number of recent investigators have been concerned with the hydrostatic and dynamic factors of blood flow and their relation to the appearance of arteriosclerosis. The muscle tone of the blood vessels is an important factor in predisposing to arteriosclerosis. Many endogenous and exogenous factors which may influence vasotonia have been cited by investigators as playing some role in this disorder. Evidence has been published indicating that either a general or a local hypertonia, if of sufficient intensity, will cause changes of an arteriosclerotic nature. The hypotonia causes a reduction in blood supply and in pulse pressure, which will lead to an ischemic anoxemia of the blood vessel wall. On the other hand, hypertonia may lead to an ischemic anoxemia by compressing the vasa vasorum against the unyielding adventitia. This local anoxemia of the blood vessel wall is believed to be an important etiologic factor.

Another concept attributes arteriosclerosis to anoxemia which may be produced in the blood vessel wall by an aberration of the normal colloidal state of the blood. This disturbance causes an impairment of the exchange of oxygen and nutritive substances between the vessel wall and the blood by interposing either a film or a precipitate composed of colloids normally present in the blood stream, thus reducing the permeability of the vessel wall. This hypothesis has added interest since highly polymerized macromolecular carbohydrates have been suggested as plasma substitutes. After repeated doses these substances may cause plasma colloid disturbances which give rise to atheromatous changes in the blood vessel walls.

The wide distribution of arteriosclerosis coupled with its increasing incidence should give studies on this problem a high priority. Owing to its polyphasic nature it, like cancer, will probably require the cooperation of both the clinical and the laboratory investigators to elucidate the cause and point to measures of prevention.

1. Hueper, W. C.: Arteriosclerosis, Arch. Path. **38**: 162 (Sept.), 245 (Oct.), 350 (Nov.) 1944; **39**: 51 (Jan.), 117 (Feb.) 1945.

Current Comment

EPIDEMIC MYALGIA, OR PLEURODYNIA

The records of this disease were reviewed editorially eleven years ago.[1] Since then a number of typical new outbreaks have been reported in this country and in Europe. The wide distribution of the disease in temperate climates is illustrated also by an outbreak in New Zealand.[2] The occurrence of the epidemics in the summer time, July and August especially, led de Rudder [3] to raise the question whether pleurodynia may not be a variant of epidemic poliomyelitis. The symptoms are however so different that poliomyelitis and pleurodynia must be regarded as etiologically distinct diseases. In reports of epidemics of pleurodynia, as in Illinois,[4] Massachusetts,[5] Missouri [6] and elsewhere, involving hundreds of cases, mostly in children, mention is not made of any simultaneous cases of poliomyelitis. This question as well as other problems of the nature of pleurodynia await the results of special investigations. So far there does not seem to have been made any biopsy or postmortem examinations in pleurodynia, and there seems to be no known record of any death from the disease. The clinical characteristics of epidemic pleurodynia were studied thoroughly by Locke and Farnsworth [5] in an explosive outbreak of 121 cases among the students of Williams College. The clinical type was constant: sudden onset with pain, fever and headache as the cardinal symptoms, the pain being the most characteristic and referable directly to the pleural covering of the diaphragm, hence in this instance at least the term epidemic pleurodynia seeming particularly appropriate. Clinically fibrinous pleuritis was demonstrated in 17 cases. Others have stressed tenderness, local swellings and firmness of hypogastric

1. Epidemic Myalgia, or Pleurodynia, editorial, J. A. M. A. **102**: 460 (Feb. 10) 1934.

2. Akel, R. N.: Epidemic Pleurodynia: Report of Outbreak at Royal New Zealand Air Force Station in Marlborough, New Zealand M. J. **43**: 289 (Dec.) 1944.

3. de Rudder, B.: Myalgia acuta epidemica und epidemische Poliomyelitis, Klin. Wchnschr. **16**: 585, 1937.

4. Kirkwood, T., and Stoll, G. G.: Epidemic Pleurodynia in Illinois, Illinois M. J. **69**: 29 (Jan.) 1936.

5. Locke, E. A., and Farnsworth, D. L.: The Clinical Characteristics of Epidemic Pleurodynia, Tr. A. Am. Physicians **51**: 399, 1936.

6. Hawkins, G. W., and Harms, F. L.: Epidemic Pleurodynia in Charlton County, J. Missouri M. A. **34**: 121 (April) 1937.

and epigastric muscles, as indicated by the term epidemic myalgia. In the Williams College as well as other epidemics the infection appears to have been spread by contact, but exactly how is not known. A rather mild redness of the pharynx has been noted in certain cases. No doubt unrecognized cases are frequent as well as carriers.

REPORT OF NUTRITION FOUNDATION

The Nutrition Foundation, Inc., has now completed its third year of organization. The original membership of fifteen food manufacturers has increased to twenty-two, with a similar number of sustaining members and seven donors. The objective of the organization has been to support independent research and education in nutrition. Basic information valuable to the food industry and important in public health has been acquired. An impressive number of studies related to many aspects of nutrition are being supported in university centers. These projects cover such subjects as determination of the basic human food requirements, utilization of nutrients within the body, food needs under special conditions and the relationship of food to health. Other projects are assisting the military forces in the solution of nutritional problems directly related to the war. *Nutrition Reviews,* the monthly publication of the foundation, provides authentic information about nutrition, keeping the general worker abreast of significant developments in nutritional research. Foreign language editions are prepared for distribution in Central and South America. This cooperative effort of the food industry makes possible a systematic study of nutritional problems. The closer relationship existing between the research laboratory and the food industry will result in nutritional betterment of the population.

QUANTITATIVE CLINICAL MICROCHEMISTRY

As late as 1912 a reliable blood sugar method required 100 cc. of blood; a glucose tolerance test, run in duplicate under these conditions, would require 800 to 1,600 cc. of blood. Biochemists, among them Folin, Benedict and Van Slyke, developed micro methods through which clinical chemistry became a practical diagnostic tool. The demand for quantitative chemical studies then increased greatly in both number and types of determinations, with a concomitant increase in the amount of blood required. Furthermore, studies were now being undertaken on infants and children from which only small samples were obtainable. By refining the usual blood chemical methods it has been possible to develop ultra micro methods which require only 0.1 cc. of serum or plasma. Using this extremely small sample for each determination, Sobel [1] has outlined methods for the determination of calcium, phosphorus, nitrogen, urea and total base in the blood. In these methods the speed is usually increased and the technic is not highly complicated. The advantages of the ultra micro methods will be that a more adequate evaluation of the chemical status of a patient can be obtained with fewer samples and in a shorter time.

1. Sobel, A. E.: Indust. & Engin. Chem., Anal. Ed. **17**: 242 (April) 1945.

THE HISTOLOGIC ENVIRONMENT OF CANCER OF THE BREAST

Through the application of suitable histologic diagnostic technics accurate differentiation between cancerous and noncancerous lesions in the breast is possible, provided the training, the experience and the judgment of the pathologist are equal to the task. This optimistic statement cannot be made with regard to so-called precancerous lesions, in spite of diligent investigation by those who have so successfully solved the problem of the histologic recognition of cancer. We possess neither the data nor the experience necessary for biologic predictions in this field. Foote and Stewart [1] have tried to find out whether there is, in their own words, "a characteristic soil in which mammary carcinoma is apt to develop." In this investigation of the histologic environment in which cancer of the breast is found Foote and Stewart have relied chiefly on anatomic and statistical methods, but they have supplemented their anatomic observations by a study of the changes in the breasts of 9 women under treatment with estrogenic substance. The material used by these workers in their anatomic and statistical studies consisted of 300 breasts removed at operation for cancer and 200 specimens of noncancerous breast tissues obtained through either partial or total mastectomy. This material was compared in great detail, especial attention being paid to the occurrence in the cancerous and noncancerous breasts of histologic changes that have long been suspected of being intimately related to the genesis of cancer. These include atrophy, cysts, duct papilloma, blunt duct adenosis, apocrine alteration of the epithelium, sclerosing adenosis, periductal mastitis, estrogenic reaction and certain other epithelial proliferative changes in the mammary lobules. A critical analysis of the data accumulated from this comprehensive study failed to show with any degree of certainty either that cancer may be expected to occur when there exists in the breast a histologic environment characterized by the presence of any one, or any combination, of the various structural alterations just listed, or that the development of cancer in the breast is related in any way to estrogenic hormonal influences. It did not prove the absence of such relationships. The contribution lies in the essentially negative outcome of the attempt of these workers to determine what is and what is not a precancerous lesion in the breast. Pathologists will be better informed and more conservative in their recommendations, surgeons will be more hesitant to perform mutilating operations, and general practitioners and internists will be less frequently called on to make embarrassing explanations to patients and their families when the full significance of the findings of Foote and Stewart in this comprehensive study of cancerous and noncancerous breasts becomes widely appreciated. Studies such as this emphasize again the important fact that the two basic pathologic processes hyperplasia and neoplasia, seen so frequently in breasts, are not just simple histologic variants but instead are essentially different biologic processes, which can be differentiated and evaluated only in terms of biologic units of measurement.

1. Foote, F. W., and Stewart, F. W.: Comparative Studies of Cancerous versus Noncancerous Breasts, Ann. Surg. **121**: 6 (Jan.) 1945.

MEDICINE AND THE WAR

ARMY

WHOLE MILK FOR PATIENTS ON HOSPITAL SHIPS

The War Department recently announced that a new method of quick-freezing whole milk is now making it possible to serve this beverage to wounded soldiers returning from overseas on Army hospital ships. This welcome and important addition to the diets on the hospital ships resulted from a series of researches carried out by the Veterinary Division of the Office of the Surgeon General.

Although the milk in some instances has been kept in the frozen state for three months, its taste is as fresh as if it had just come from the cow and the bacterial count is lower than that in the average milk supply of the average American home.

Approximately 30,000 pints of frozen whole milk is now being shipped monthly from Charleston and Boston, and additional large amounts from New York, New Orleans, San Francisco and Seattle.

While the milk is intended for the hospital ships, some of it, when the situation makes it possible, will be sent to overseas hospitals as well. Later it is expected to enlarge shipments for the hospitals. In addition, 400,000 pints is being shipped monthly to Alaska for the general use of American troops stationed there.

PROTECTION AGAINST SCRUB TYPHUS MITE

The War Department recently announced that the Office of the Quartermaster General, on recommendation of the Office of the Surgeon General, is replacing dimethyl phthalate with benzyl benzoate for use in clothing impregnation for protection of troops against the scrub typhus mite, so prevalent in the South Pacific. Clothing impregnated with benzyl benzoate will withstand more launderings before treatment is necessary than those impregnated with dimethyl phthalate. Clothing is dipped in an emulsion of 5 per cent benzyl benzoate in water. One treatment is effective for about two weeks.

1882d SERVICE UNIT RECEIVES AWARD

The 1882d Service Unit, Regional Hospital, Camp Maxey, Texas, was recently cited for superior performance of arduous duties in the care of injured persons resulting from a tornado at Antlers, Okla., April 12, 1945. The devotion to duty displayed by the hospital personnel and the numerous patients who volunteered their services, while coping with a serious situation created by this disaster, adds another achievement to the long list already attained by the Medical Department in war and peace.

ARMY AWARDS AND COMMENDATIONS

Colonel Crawford F. Sams

Col. Crawford F. Sams, chief of the planning branch, Supply Division, was recently awarded the United States of America Typhus Commission Medal. His citation declares that Colonel Sams "rendered distinguished service from January to August 1943 in connection with the work of the United States of America Typhus Commission. As chief surgeon at headquarters of the United States Army Forces in the Middle East, he aided the commission personally and administratively in establishing its first field headquarters at Cairo, Egypt. He assisted in the organization of the commission's early studies of typhus control in Egypt and put at the disposal of the commission essential facilities for all of its investigations. During the critical period of the initial activities of the commission in his theater of operations overseas, Colonel Sams contributed sound advice and guidance based on his expert knowledge of the problems to be solved. His assistance was a direct aid to the advancement of typhus control." Dr. Sams graduated from Washington University School of Medicine, St. Louis, in 1929 and has been in the service since July 1, 1930.

Lieutenant Colonel Robert E. Lyons Jr.

The Legion of Merit was recently awarded to Lieut. Col. Robert E. Lyons Jr., formerly of Shreveport, La., for "Services as chief of the medical record division, Eighth Air Force, from July 1942 to December 1943. He devised methods of compiling wound and injury data from sick and wounded reports and field medical records which resulted in a complete medical record of Eighth Air Force combat wounds. The major portions of the body receiving wounds were indicated by percentages, representing a total of all wounds. This important record revealed that a large proportion of serious and fatal battle wounds among air crews was caused by relatively low velocity missiles incurred in an area of the body that could be protected by armor. Based on this study, individual armor equipment for the protection of air crew members was developed and standardized throughout the Eighth Air Force. By constant review of medical records, he continually developed new methods of presenting and interpreting statistical data. He charted the geographic incidence and sources of injuries and diseases which resulted in an immediate intensification of the venereal disease program in all areas. He utilized the material in the revised care of flier report to prepare charts and data which contributed greatly to the reduction of frostbite and anoxia, thereby increasing the training level of combat crews before their shipment to the theater. He further conducted exhaustive research in the development of accurate attribution tables for air crews of heavy bombardment units by reviewing the combat history of hundreds of crew members in each crew position throughout their entire combat careers. After an enormous amount of work and research he completed the report which served as a temporary basis for computing replacement requirements and proved invaluable to the Army Air Forces material and services commands. By his untiring efforts, competent grasp of the situation and high devotion to study he contributed materially to the outstanding success of the aerial offensive against the enemy." Dr. Lyons graduated from Loyola University School of Medicine, Chicago, in 1937 and entered the service Oct. 24, 1940.

Lieutenant Colonel Douglas B. Kendrick Jr.

The Legion of Merit was recently awarded to Lieut. Col. Douglas B. Kendrick Jr., formerly of Washington, D. C. According to the citation, "while serving as chief of the division of surgical physiology, Army Medical School, Army Medical Center, Washington, D. C., from March 1, 1941 to Nov. 1, 1942 he distinguished himself by performing the duties of that office in an exceptionally meritorious manner by developing the program of the Army for obtaining adequate supplies of liquid and dried plasma, by developing the package for dried plasma, by developing the method for obtaining and processing liquid plasma and by establishing plasma centers for the zone of the interior, which has reflected great credit on him and on the military service." Dr. Kendrick graduated from Emory University School of Medicine, Atlanta, Ga., in 1931 and entered the service Dec. 7, 1936.

Major Bernard Rogoff

Major Bernard Rogoff, formerly of Ozone Park, N. Y., was recently awarded the Bronze Star Medal "for meritorious service in connection with military operations against an armed enemy at ——, Burma, from March 26, 1944 to April 8, 1944. During this thirteen day engagement Major Rogoff was commanding officer of the Medical Detachment of the 2d Battalion, —— Composite Unit. Major Rogoff displayed outstanding courage and judgment in the efficient handling of many seri-

ous casualties at a time when evacuation was impossible and the aid station was subject to constant hostile fire. His calm courage, exhibited under most adverse circumstances, was inspiring to the wounded and to his own men and contributed largely to the superior performance of the detachment. Major Rogoff's conduct reflects great credit on himself and on the armed forces of the United States." Dr. Rogoff graduated from the University of Geneva, Switzerland, in 1936 and entered the service June 1, 1940.

Colonel Byron L. Steger

Col. Byron L. Steger, commanding officer of the 51st General Hospital in the Southwest Pacific, was recently awarded the Legion of Merit. The medal was given in recognition of his services from November 1942 to October 1943, when he was director of medical training at the Army Service Forces Unit Training Center, New Orleans. Dr. Steger graduated from Ohio State University College of Medicine, Columbus, in 1933 and entered the service Dec. 1, 1934.

Major Charles W. Yost

Major Charles W. Yost, formerly of Portland, Ore., was recently awarded the Bronze Star for meritorious service as Regimental Surgeon. The citation reads in part that "in the direction and supervision of medical service in combat and in the evacuation, care and treatment of the sick and wounded the leadership, judgment and devotion to duty displayed by Major Yost have been of superior quality." Dr. Yost graduated from the University of Cincinnati College of Medicine in 1938 and entered the service Dec. 9, 1940.

Captain George H. Lage

An Oak Leaf Cluster to the Purple Heart was recently awarded to Capt. George H. Lage, formerly of Portland, Ore., because of his second wound. Dr. Lage also holds the Silver Star and shares in the Presidential Citation given his unit for its services in the invasion of Normandy as well as the Oak Leaf Cluster for its part in the invasion of the Netherlands. Dr. Lage is now on limited duty with a hospital in England. He graduated from the University of Oregon Medical School, Portland, in 1939 and entered the service Sept. 22, 1942.

Captain Frank R. Hanrahan

Capt. Frank R. Hanrahan, formerly of Cleveland Heights, Ohio, was recently awarded the Bronze Star for "heroic achievement in connection with military operations against the enemy during his division's historic reduction of Metz." He directed operations of a battalion aid station in a highly distinguished manner, despite continuous exposure to enemy fire, and his heroic performance of duty was instrumental in saving many lives. Dr. Hanrahan graduated from Western Reserve University School of Medicine, Cleveland, in 1942 and entered the service July 16, 1943.

Colonel Norton Canfield

Col. Norton Canfield, formerly of New Haven, Conn., was recently awarded the Bronze Star for meritorious service. He is senior consultant in otolaryngology in the office of the chief surgeon at a base overseas. Dr. Canfield graduated from the University of Michigan Medical School, Ann Arbor, in 1929 and entered the service Dec. 1, 1942.

Captain Logan E. Jackson

Capt. Logan E. Jackson, formerly of Portland, Ore., was recently awarded the Bronze Star "for meritorious service in France. An outstanding example of Captain Jackson's leadership and cool judgment is the fact that he has not had a man lost through enemy action during the many combat engagements of this unit." He is commanding officer of a collecting company attached to the 35th Infantry Division and was with the 3d Army in its sweep through the Normandy beachhead and France and into Germany. Dr. Jackson graduated from the University of Oregon Medical School, Portland, in 1943 and entered the service Dec. 26, 1943.

NAVY

MARINE CORPSMAN INVENTS NEW TYPE STRETCHER

A new type stretcher, invented by Navy Chief Pharmacist's Mate John A. Gallegher and known as the Gallegher stretcher, is now being used daily over the tortuous hillside trails and down cliff-like embankments from which Marines are forced to root out encaved enemy machine gun and artillery nests. It is carried by from one to six men, can be used rigid or otherwise, and may be lowered by rope with the patient fully secure.

The stretcher weighs 4 pounds 6 ounces. It is transported in a small pack attached to the cartridge belt. Poles are inserted into its lengthwise seams if rigidity is preferred. Bamboo, usually abundant in the South Pacific, is used often. Three overlapping straps secure the patient in the lying position, while two other straps may be fastened around the thighs, similar to the way a parachute harness is applied, if the wounded man is to be lowered by line over an embankment.

Navy Chief Pharmacist's Mate John A. Gallegher, formerly of Brooklyn, is attached to Major Gen. Lemuel C. Shepherd's Sixth Marine Division. He has been in the service twelve years, eight of which were spent with the Marine Corps. He received a commendation for evacuating wounded from in front of the line of battle at Tulagi.

NAVY AWARDS AND COMMENDATIONS

Lieutenant Ralph W. Getty

Lieut. Ralph W. Getty, formerly of Syracuse, N. Y., was recently awarded the Bronze Star for his work during the Saipan and Tinian operations, where he was attached to the Fourth Marine Division. Dr. Getty graduated from Syracuse University College of Medicine in 1941 and entered the service July 14, 1942.

Lieutenant James S. Cate

The Bronze Star was recently awarded posthumously to Lieut. James S. Cate (DC), U.S.N.R., formerly of Baker, Ore. The citation accompanying the award read "For heroic service while attached to the 23d Marines, 4th Marine Division, during action against enemy Japanese forces on Saipan and Tinian Islands, Marianas Group, from June 15 to July 23, 1944. Voluntarily accompanying the regimental medical section in extremely hazardous operations, Lieutenant Cate repeatedly went to the aid of the wounded despite the peril of intense enemy artillery and mortar fire. With calm courage he skilfully treated and evacuated the stricken men, continuing his heroic efforts until he himself was mortally wounded. Lieutenant Cate's valiant conduct and cool disregard for his own personal safety were in keeping with the highest traditions of the United States Naval Service. He gallantly gave his life for his country."

Commodore William W. Hargrave

For serving as medical officer in command of the United States Naval Hospital, Pearl Harbor, Territory of Hawaii, and later as medical officer in command of the United States Naval Hospital, Aiea, Territory of Hawaii, Commodore William W. Hargrave, formerly of Philadelphia, was recently awarded the Legion of Merit, the citation reading "for exceptionally meritorious conduct in the performance of outstanding services to the government of the United States as medical officer in command of the United States Naval Hospital, Pearl Harbor, T. H., from Aug. 17, 1943 to July 3, 1944 and as medical officer in command of the United States Naval Hospital, Aiea, T. H., from July 4, 1944 to Feb. 9, 1945. A counsellor and director of rare understanding and broad vision, Commodore (then Captain) Hargrave exercised unfailing tact and wisdom in the administration of both hospitals and, applying his special knowledge with skill and judgment, created and maintained exceptionally high standards of professional service to the patients under his command. By his close personal

supervision, his sympathetic concern and genuine interest in the individual welfare and morale of personnel, Commodore Hargrave inspired and encouraged the rapid rehabilitation of patients essential to the successful prosecution of the war against Japan." Dr. Hargrave graduated from the Medical College of Virginia, Richmond, in 1912 and has been in the service since Nov. 2, 1914.

Commander Arthur Proctor Black

Comdr. Arthur P. Black, formerly of El Paso, Texas, was recently awarded the Bronze Star "for heroic service as senior medical officer in charge of a field hospital in northeastern China. Attached to the U. S. Naval Group, China, from Aug. 15, 1943 to Dec. 6, 1944, Commander Black was assigned the duty of organizing and establishing a field hospital in a forward area in the spring of 1944. Although handicapped by poor transportation facilities and the necessity of having most of the hospital equipment and fixtures made locally, he achieved exceptional success in carrying out this difficult project, effectively treating many Americans, some of them escaped from enemy concentration camps, and saving the lives of many wounded Chinese. His exceptional ingenuity, leadership and professional skill under difficult and, at times, adverse conditions were in keeping with the highest traditions of the United States Naval Service." Dr. Black graduated from Johns Hopkins University School of Medicine, Baltimore, in 1926 and entered the service June 10, 1941.

Commander Raymond R. Callaway

Comdr. Raymond R. Callaway, formerly of Birmingham, Ala., was recently awarded the Legion of Merit for his direction of five medical companies while under fire on Guam. The citation mentioned "exceptionally meritorious conduct in the performance of outstanding service . . . during the attack on Guam . . . from July 21 to Aug. 10, 1944. During the planning for the operations against the enemy on Guam he indoctrinated, trained and brought to a high state of efficiency and morale the personnel of the medical battalion. . . . He commanded, coördinated and supervised the activities of the five medical companies in such a manner as to assure prompt and efficient treatment of casualties. During the organized enemy attack on the division hospital on the morning of July 26, 1944 he organized the defense by hospital corps personnel and supervised the evacuation of casualties from the combat zone. All through this period he was frequently exposed to rifle, machine gun and mortar fire and without regard for his own safety contributed greatly to the defense of the hospital area. He displayed high professional skill and sound judgment as commanding officer of the five medical companies of the medical battalion and by his leadership and example contributed materially to the success of this campaign. . . ." Dr. Callaway graduated from the University of Illinois College of Medicine, Chicago, in 1928 and entered the service Dec. 1, 1941.

MISCELLANEOUS

FIGHT DISEASE IN GERMANY

American personnel, displaced persons and German prisoners of war are being safeguarded against communicable diseases and tuberculosis under a sanitation program directed by 5th Infantry Division medical officers in that part of the Ruhr controlled by the 5th.

Lieut. Col. Enos G. Walker, Detroit, division surgeon, and Lieut. Col. Howard H. Base, commanding officer of the 5th Medical Battalion, are directing the sanitation program for Allied personnel, the division's three displaced persons camps and seven Allied prisoner of war camps. By installation of an adequate diet and sufficient sanitation and medical facilities, the 5th Division team has cut the death rate 65 per cent a day in one prison camp.

About 75 persons are evacuated each day in the Hemer prison camp, Colonel Walker said. Of this number about 65 prisoners are suffering from dysentery and 6 from typhus. Small hospitals are being established in the vicinity of prison camps.

Guarding against the spread of typhus the division medical group is delousing thousands of displaced persons daily through use of DDT powder. Allied medical personnel are being assisted in prisoner of war camps by German medical units which have set up their own dispensary facilities, using American supplies and working under 5th Division supervision.

Buildings in the 5th's area of control are being sprayed with DDT powder to destroy breeding places of the typhus carrying louse. In addition to other precautions, men of the division are being educated to take precautions against being bitten by the lice because typhus inoculations are not 100 per cent preventive against the disease.

SELECTION OF FLYING PERSONNEL

Medical representatives of major airlines and aircraft manufacturers, members of the Airline Medical Directors Association, recently met at the Army Air Forces School of Aviation Medicine, Randolph Field, Texas, to study the methods that the Army Air Force has found most effective in the selection of flying personnel and the maintenance of their health.

Following an introductory address of Brig. Gen. Eugen G. Reinartz, commandant of the School of Aviation Medicine, individual members of the staff lectured on topics in which they specialize. The conference was held to aid the civilian doctors in preparing for the increasingly important role which they will play in postwar aviation. The problem of the "combat returnee and his place in postwar aviation" was one of the major topics of the conference.

MEDICAL AND HEALTH EXPERTS SENT TO CHINA

Herbert H. Lehman, Director General of the United Nations Relief and Rehabilitation Administration, recently announced that arrangements have been completed to send thirty medical and health experts to China to train personnel in medical centers to be established by the Chinese government. UNRRA will provide the essential medical supplies to equip the training centers. Shipment of these supplies has already started. It is estimated that within the coming months some 90,000 pounds of medical equipment will be sent to China.

The Chinese government plans to establish training centers in Chungking and Chengtu early this summer and later in Kweiyang. When Nanking and Peiping are liberated from Japanese control, other centers will be established in these cities. Short intensive courses averaging from six to eighteen months will be given to people recruited in China by the Chinese government. Refresher courses for medical practitioners, public health courses for recently graduated doctors and nurses who have not had public health experience, technical courses for partially qualified doctors and nurses and training courses for attendants, nurses and midwives will be given.

One of China's most serious needs is for skilled medical and technical personnel, and provision of foreign experts is part of the relief and rehabilitation program for China. Even before the Japanese invasion, China's public health services were inadequate for her population, and there was a shortage of doctors and nurses, medicines and hospital equipment. Now after eight years of war it is estimated that there is only 1 doctor for every 40,000 persons in China and 1 hospital bed for every 10,000 persons. War action has wrecked sewage disposal plants and contaminated water supplies. Up to 40 per cent of the hospitals in China have been destroyed or looted. The danger to national health will be even greater when the millions of Chinese who have been driven from their homes start their return. It has been estimated that China will need to train roughly 35,000 technicians in the next four years to administer her medical relief program.

For this program UNRRA is now recruiting medical experts in the United States, Great Britain, Australia and Canada. The recruits include surgeons, physicians, dentists, nurses, sanitary engineers, hospital and public health administrators and other specialists of various kinds. First to be sent to China will be the men with general medical experience. The specialists will follow later after the training programs are set up.

ORGANIZATION SECTION

Washington Letter

(From a Special Correspondent)

June 11, 1945.

Veterans Administration Probe Continues Despite Bradley Appointment

Investigation of the Veterans Administration will continue despite appointment of Gen. Omar N. Bradley to replace Brig. Gen. Frank T. Hines, who is to be given another assignment by President Truman. Chairman John E. Rankin of the House Committee on World War Veterans Legislation said that the change in chiefs would not affect the inquiry into the agency prompted by allegations of mismanagement of hospital and medical facilities.

Inadequate Hospitalization Found by Veterans of Foreign Wars

In its findings on conditions in Veterans Administration hospitals, to be released tomorrow, the Veterans of Foreign Wars reports that inadequate hospitalization for discharged veterans were found in 47 per cent of the hospital facilities operated by the Veterans Administration. Its survey, like the legion investigation, was conducted at the invitation of Brigadier General Hines. "We find grave conditions that must be corrected immediately," said Joseph M. Stack of Pittsburgh, Senior Vice Commander in Chief of the Veterans of Foreign Wars. "As we anticipated, the report underlines the shocking need for construction of a large number of new facilities and the desperate shortage of trained medical and service personnel. Management of the hospitals, both in the Veterans Administration central office and in the field, is subject to considerable, apparently justified, criticism. Unconfirmed allegations of abuse and mistreatment of veteran patients dot the individual state reports. But, while our overall survey discloses singularly few substantiated cases of mistreatment, there are too many instances of alleged and physical abuse cited for the Veterans of Foreign Wars not to demand an immediate sympathetic investigation of every charge by an impartial, authoritative body." The organization advocated an "undercover" probe, assuring immunity to each complainant.

Reorganization of Veterans Medical Division Urged

The entire Veterans Administration medical division should be reorganized and a medical man of the highest professional caliber should be appointed to direct hospitalization, treatment and care, the American Legion will recommend tomorrow to the House committee investigating the Veterans Administration. In a dual report prepared for release on June 12 the legion proposed (1) a list of eleven recommendations based on the results of a hospital and medical survey ordered by National Commander Edward N. Scheiberling in the nation's ninety-seven veterans' facilities and (2) a ten point administrative program calling for an administrator and six instead of three assistant administrators and also decentralization of much detail to eliminate red tape. "Hospital treatment and care should be at the same high level as that in the famous Mayo Clinic and Johns Hopkins Hospital," the report stated. The legion claims that veterans' hospitals are suffering from lack of medical personnel, red tape, staff dissension at some points, overcrowding and such low pay scales that staff morale is adversely affected. In some instances there is urgent need for latest scientific equipment. The legion recommended that the outstanding medical man to be assistant administrator or to have equal status should head the medical, surgical, clinical, dental, hospital and domiciliary services.

Veterans Administration Official Denies Charges

Magazine articles by Albert Q. Maisel criticizing treatment given ex-servicemen in the Veterans Administration were branded by Director John H. Baird of Veterans' Neuro-Psychiatric Hospitals as "distortions of the truth, half-truths and malicious falsehoods" during his testimony before the House Veterans Committee. "Mr. Maisel's articles," he said, "should be entitled 'Third Rate Lying and Slander for Money and Undisclosed Purposes' instead of 'Third Rate Medicine for First Rate Men.'" He further told the committee "Do not understand that I am contending that the care and treatment of our patients is all that we desire. Progressive medicine calls for continuous change and improvement. What I am telling you is that we are not practicing third rate medicine." He further stated that he was "not entirely satisfied" with the doctors under his control. He claimed that Civil Service standards are too loose to permit him to hire the type of physicians he required and he urged the committee to approve the pending bill to take Veterans Administration medical divisions out of the Civil Service System.

Approval of Permanent Postwar Scientific Research

A permanent postwar program of scientific research and development has been appoved by the House Military Affairs Committee. It authorized an annual expenditure of $8,000,000 for work to be conducted by the National Academy of Sciences through a research board made up of civilians of outstanding accomplishments" and Army and Navy representatives. President Truman has given War Mobilization Director Fred M. Vinson responsibility for reviewing scientific and technical information so that information which has been restricted for security reasons can be given to the public. The idea behind the executive order is to release details of scientific and technical progress developed during the war by the government. The Navy Department reports that it has formed a new Office of Research and Inventions to develop weapons and battle technics for use in the event of another war. The new office merges the Naval Research Laboratory, the Special Devices Division of the Bureau of Aeronautics, the Office of Research and Development and the Office of Patents and Inventions. Navy Secretary James V. Forrestal will have direct supervision, while Rear Adm. Harold Bowen, known for his work with radar, will head the new office. The War Production Board also reveals that its Office of Production Research and Development has participated and cooperated in developing methods for increasing domestic production of quinidine and in developing superior processes for manufacture of DDT, and also helped to create a successful rubberless adhesive, using non-critical materials.

President Warns That Chemicals Should Remain on Critical List

In his outline of the war situation President Truman warned that certain chemicals, along with food, clothing, petroleum products and lumber, will remain on the critical list until the defeat of Japan. They are among a number of items, he said, in which there will be little lessening of demand for an indefinite period.

Capital Notes

Edward D. McKim, chief administrative assistant to President Truman, has denied that "politics" influenced the recent announcement that a new veterans' hospital would be constructed in eastern Montana.

An annual life insurance fund to be devoted to promotion of medical research was announced here by M. Albert Linton,

chairman of the joint Medical Research Committee of the American Life Convention and the Life Insurance Association of America. Half a million dollars is expected to be the amount of the fund available each year. The exact amount will depend on the number of companies accepting the invitation to participate.

Sanitation of merchant ships will be handled under a unified engineering and inspection program announced by the United States Public Health Service and the War Shipping Administration.

National Rehabilitation Week, proclaimed by President Truman, is being held to direct attention to the plight of the physically handicapped.

The War Production Board announces that the production period during which nurses' uniforms may be manufactured has been extended ninety days, or until the end of September.

Postwar Medical Service

MINUTES OF MEETING OF MAY 12

The meeting of the Committee on Postwar Medical Service was called to order by the Chairman, Dr. Ernest E. Irons, at 10:04 a. m., Saturday, May 12, in the Board of Trustees Room of the American Medical Association Building in Chicago

There were present Dr. Irvin Abell, Dr. Paul C. Barton, Lieut. Col. Robert D. Bickel, Dr. Walter L. Bierring, Dr. Paul C. Bucy, Dr. F. F. Borzell, Dr. C. W. Camalier, Capt. C. W. Carr, Dr. Frederick A. Coller, Mr. Graham L. Davis, Dr. Morris Fishbein, Dr. Evarts A. Graham, Dr. E. L. Henderson, Mr. Thomas A. Hendricks, Dr. W. W. Herrick, Dr. Ernest E. Irons, Dr. Victor Johnson, Dr. Edwin P. Jordan, Lieut. Col. H. C. Lueth, Dr. James M. Mason, Col. Hugo Mella, Col. F. V. Meriwether, Dr. James E. Paullin, Brig. Gen. Fred W. Rankin, Rev. A. M. Schwitalla, S.J., Dr. R. L. Sensenich, Dr. H. H. Shoulders, Dr. LeRoy H. Sloan, Mr. Barry C. Smith, Dr. Olin West, Major Richard J. White, Dr. R. C. Williams and Dr. Fred C. Zapffe.

Approval of Minutes.—The Chairman presented the minutes of the meeting of the Committee on Postwar Medical Service held on March 17, 1945 as they had been circulated and stated that a correction in the wording of his remarks had been submitted by Col. G. F. Gessner, that copies of the minutes containing this correction were available to the members and that the correction had also been incorporated in the printed minutes which appeared in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION for May 12. The minutes as circulated, with the correction mentioned, were approved.

Membership.—It was announced by the Chairman that Lieut. Col. Gerard F. Gessner, who has attended meetings of the Committee as a representative of the Surgeon General's Office of the War Department, has been assigned to other duties, and that Lieut. Col. Harold C. Lueth, formerly liaison officer between the Office of the Surgeon General and the American Medical Association, has been designated to take Colonel Gessner's place. The Chairman also announced that Capt. C. W. Carr of the Great Lakes Naval Training Station was in attendance at the present meeting to represent the Bureau of Medicine and Surgery of the Navy in place of Capt. William E. Eaton, the regular representative; that Dr. Paul C. Bucy was again in attendance to represent the Advisory Board for Medical Specialties, and that Dr. Paul C. Barton, Executive Officer of the Procurement and Assignment Service for Physicians, Dentists and Veterinarians, represented that service in the absence of Miss Mary E. Switzer, who was unable to be present.

Further Report on Questionnaires Sent to Medical Officers.—Lieut. Col. H. C. Lueth presented the following brief report supplementing the report given at the previous meeting:

> The section of the analysis of the questionnaires returned by medical officers dealing with economics will be presented to the Editor of THE JOURNAL. (It appears on page 528 of this issue.) The matter of most importance in this section is the question of the median monthly salary. It was asked in the questionnaire how much money medical officers would desire if they were to be on a full time paid monthly basis. The median salary desired is $583 a month. The different graduation groups show a surprisingly small variation. An even smaller variation occurs among men from the smaller communities.
>
> Perhaps the most interesting feature is the problem of whether the medical officers wish to enter group or private practice. The analysis shows that the majority wish to go into private practice by themselves or in a group. The greatest majority want to practice in an individual capacity.

Colonel Lueth's summary was received and publication of the full report authorized.

Request of American College of Hospital Administrators.—The Chairman presented a letter from the American College of Hospital Administrators in which it was stated that that organization is conducting a survey of officers in the Medical Administrative Corps of the Army to determine their interest in hospital administration as a career on returning from service and in which also the request was made that pertinent information, including names and addresses contained in the questionnaires of the Committee on Postwar Medical Service, be made available to the American College of Hospital Administrators.

Mr. Graham L. Davis stated that the College of Hospital Administrators and the American Hospital Association are working with several universities to establish courses of training, at the graduate level, in hospital administration; that it is desired to find out how many medical officers would be interested in going into hospital administration when demobilized, and that it had been thought the questionnaires would be an excellent source for such information. Colonel Lueth said that unfortunately the records compiled from the returned questionnaires are not on a name basis and that it is not known who wishes certain courses but only how many. He suggested that it might be well to get in touch with the various separation centers through which every man to be released from service must pass. Dr. Paul C. Barton stated that the Procurement and Assignment Service sends a questionnaire to every man under its purview who is leaving active duty, that about 50 per cent are returned and that if any of the men should say anything about hospital administration the Procurement and Assignment Service would let them know about this opportunity.

Some members of the Committee thought that to furnish the information requested might be interpreted as violative of confidences, and it was the final opinion of the Committee that it would be inadvisable to grant the request of the American College of Hospital Administrators. A motion was adopted approving the reply of the Chairman, in which it had been stated that the overall values for medical officers interested in hospital administration could be obtained from the recently published analysis of the returned questionnaires.

Request from Publisher of "Industrial Medicine."—The Chairman presented a communication from the publisher of *Industrial Medicine,* who wishes to reprint in that periodical Colonel Lueth's report on "The Medical Officer and Future Industrial Practice," which appeared in THE JOURNAL, May 12. It was the opinion of the Chairman and of the Committee that this was a matter for decision by the Editor of THE JOURNAL.

Further Report on Educational Internship and Residency Opportunities for Medical Officers.—Dr. Victor Johnson presented the following report:

> The Council on Medical Education and Hospitals has completed an analysis of the facilities for advanced training of veterans requiring expansion as well as the degree of expansion required in each field to meet the demands indicated by the questionnaires returned from medical officers.

This report will be published in detail shortly. The areas in most acute need are in surgery and its subspecialties, where nearly 1,600 new residencies will be required, and in medicine and subspecialties, where nearly 1,100 new residencies will be required. Large numbers of places will be needed in rotating internships and in obstetrics and gynecology.

Reports from hospitals are continuing to come in and indicate a fair likelihood that the expansion needs will be met if all concerned continue as vigorously as they have in the past in planning for the postwar period. The Council is now engaged in following up the original circular to obtain information from a considerable number of hospitals which have not replied. It is anticipated that a list of available residencies for the postwar period will be incorporated into the regular list of such house officerships published annually by the Council in the Educational Number, which will appear this year early in September.

In review and refresher short courses it is evident that the most acute need for expansion lies in the field of courses of three to six months' duration. There appear to be available now a sufficient number of courses of shorter duration, especially those of a month or less.

The Bureau of Information and the Council on Medical Education and Hospitals are cooperating in a reporting system from hospitals which makes available at frequent intervals information concerning vacancies in house officerships. This system will supply the relatively few medical officers who return within the next few months with the information they desire until the complete published lists can be produced.

In addition to the plans made by hospitals and medical schools, several of the state medical societies are also planning to assist in the educational program after the war, partly by contributing to teaching programs in which individual members are involved, partly by offering short courses under the auspices of the state medical society and partly by establishing funds to supplement other stipends which might be available to the returning physician during the training period. A survey is being made of all state medical societies requesting the details of such programs as may be contemplated.

Dr. Johnson's statement was received as a continuation report.

Dr. W. W. Herrick informed the Committee concerning a tentative plan of the New York Academy of Medicine to organize courses in New York City that will not be under university management, and the Chairman said that he thought similar procedures were being taken in Chicago and no doubt in many other places. Dr. Fred C. Zapffe stated that, as Secretary of the Association of American Medical Colleges, he had sent out a number of memoranda to medical schools about refresher courses and had received replies from about a dozen schools, a number of which maintained that nothing could be done until members of the faculties now absent in war service had returned; others are working on plans. He was sure that the medical schools will be ready. In reply to a question from Dr. LeRoy H. Sloan as to what is being done for the men now being discharged, Dr. Johnson stated that this matter is being handled through the Bureau of Information and asserted that there is no difficulty at all just now, since the hospitals are short of house officers and the Procurement and Assignment Service has declared that discharged medical officers accepted as house officers by hospitals will not be included in the hospitals' quotas. It was brought out in the discussion that many hospitals did not seem to be informed of this decision of the Procurement and Assignment Service, so that when some of the discharged men have applied for places they have been told that the hospitals were bound by the Procurement and Assignment Service and could not extend their facilities or their residencies, which, under the quotas, were filled up for two or three years to come. Dr. Barton stated that announcements concerning the decision of the Procurement and Assignment Service had been sent out more than once but that he would circularize all the hospitals again at the earliest possible time. Father Schwitalla mentioned that the Veterans Administration has figures on the number of men who are now in schools and hospitals under the G. I. Bill of Rights, that this information could be obtained easily and that hospitals are now taking in men on a nonquota basis.

Report on Bureau of Information.—Dr. Olin West informed the Committee that the Bureau of Information is not receiving as promptly as it had hoped the master sheets that contain information that it was desired to have checked in the individual states. He thought the chief reason for this, however, was that the state society offices were operating with depleted personnel. He stated that the Bureau of Information intends to act in strict, cordial and persistent cooperation with the state and county medical societies. The returns that have come in from the state and county medical societies are for the most part extremely informative. Dr. West deplored the fact that the state records, the records of the Bureau of Information and the Army records are not altogether in agreement. He reported that a number of inquiries already had been received from medical officers who have completed their terms of military service and wish to secure information that will enable them to move into a location at once. They are interested in communities that are at present short of physicians. Dr. West stated "We want to guard as fully as we can against the filling of places of men who expect to return to their own homes; we don't want to put others in their places." Some of the states are developing and wish to operate their own plans, and he knew of no reason why they should not do so and also cooperate with the Bureau of Information. He doubted that the machinery was as yet fully set up in the states. It is the plan of the Bureau of Information to refer to the states the men who are looking for locations. The collection of pertinent information will proceed and in due time the Bureau will be in position to be of great help. Dr. West stated that, if the members of the Committee wished to have more detailed information concerning the Bureau of Information, Lieut. Col. R. D. Bickel, liaison officer, would be glad to supply it.

Dr. Barton informed the Committee that the Procurement and Assignment Service has for some time been trying to do something quite similar, that with respect to the discrepancies in the records the Procurement and Assignment Service has some fine field workers who do nothing but check the lists and that theoretically the lists which the Bureau of Information obtains from the local Procurement and Assignment workers when checked with the information available at American Medical Association headquarters should bring the records into agreement. Dr. Barton mentioned two points in connection with the program of the Bureau of Information, the first being the policy concerning men over 65 years of age. He thought that the majority of these older men are located in communities to which younger men will never be attracted and that to leave the former out of the picture is to cause distortion. His second point was that he was in agreement with Dr. West's contention that the practices of men now in service should be saved for them, but he wondered if in adhering strictly to that procedure the field was not left open for less professional practitioners. Dr. West then asserted that with respect to sending men into areas where physicians are needed the plan was to let the states settle that, that no pressure will be put on any community or state and that the whole plan is to be helpful to the men themselves.

Dr. James E. Paullin pointed out that the phase of the Committee's plans that is being carried on through the Bureau of Information can best be done ultimately at a state level; state organizations know the needs in a particular state; the redistribution of physicians in rural areas is important; a letter might be sent to state organizations stating the purposes of the Committee on Postwar Medical Service, particularly in the matter of location of physicians in needy areas.

Report of Subcommittee to Draw Up Recommendations to the Governors of the States Concerning the G. I. Bill of Rights.—Dr. H. H. Shoulders, chairman of the subcommittee, reported as follows: The letter that was prepared by the subcommittee along the lines agreed on at the last meeting of the Committee on Postwar Medical Service was incorporated in the minutes of that meeting and published as a part of the minutes in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION for May 12. The letter was sent to the governors of each of the forty-eight states, to the president of the Board of Commissioners of the District of Columbia and to each territorial governor with the exception of the Virgin Islands and the Philippines. At the same time a copy of the "Governors Letter" was forwarded to the secretary and to the president of each constituent state and territorial medical association. Replies have so far been received from thirty-five governors and appear to be entirely favorable and cordial.

It was suggested by several present that follow-up letters should be sent to the state medical society secretaries, and Dr. Shoulders thought the governors might be asked to supply the committee with lists of those who are functioning as accreditors. No action was taken.

The report was received and the subcommittee continued.

Report of Subcommittee on Enrolment of Medical Students.—The Chairman announced that Dr. Victor Johnson would serve as chairman of the Subcommittee on Enrolment of Medical Students, and Dr. Johnson presented the following report:

There has been considerable delay in consideration of the Ellender bill by the Senate Committee on Military Affairs. This bill was introduced late in February and seeks to correct the present policies and regulations which will either reduce medical school freshman enrolments materially in 1945 and drastically in 1946 or result in the admission of inferior applicants by some schools. The delay was caused by failure of the Army, the Navy and the Selective Service System to communicate with the Senate committee expressing their views on the bill.

However, hearings were finally conducted on May 1. The Army, the Navy and the Selective Service System oppose the bill, contending that deferment of the few thousands involved would seriously hamper the war effort. The measure was called unnecessary, since it was claimed that adequate numbers would be available for these classes without deferments. Medical education was represented at the hearings by Dr. Walter Bloedorn of the executive council of the Association of American Medical Colleges and Drs. Harvey Stone and Victor Johnson of the Council on Medical Education and Hospitals of the American Medical Association. Dr. Johnson presented a joint statement over the signatures of Dr. Fred C. Zapffe and himself and in addition answered numerous questions by the senators. Dr. Stone reinforced and supplemented the contentions of the joint statement.

As nearly as could be judged from the attitude of the senators, there appears to be considerable doubt that favorable consideration will be given the bill. This is particularly true because of the strength of the opposition and not because of the individual opinions of the senators, who seemed impressed by the information provided them. The hearings have been published, and it is planned that the committee will consider recommendations on this measure on Tuesday, May 15. Should this measure fail, attempts should again be made through adjustment of the regulations in the light of the altered military situation.

Dr. Zapffe stated that he had received a telephone call from Washington the day before to the effect that the Ellender bill is unlikely to receive favorable action. A lengthy discussion ensued, during which Dr. Herrick stated that the New York Academy of Medicine is to have a meeting very soon at which this matter will be taken up, and Father Schwitalla read paragraphs from the report of his Subcommittee on Graduate Education of Physician Veterans, which he later presented in full.

Dr. C. W. Camalier said that the American Dental Association is much interested and that the 1945 classes in dentistry were affected. After further discussion Dr. Johnson stated that there is no intention of quitting now but that every opportunity will be taken to get some satisfactory adjustment.

The Committee assented unanimously to the Chairman's appointment of Dr. Evarts A. Graham as an additional member of the Subcommittee on Enrolment of Medical Students.

It was Dr. Fishbein's opinion, in which the Committee concurred, that every possible means should be taken to acquaint the public—and not merely the medical profession—with the seriousness and urgency of this matter. Dr. Barton thought the Chamber of Commerce of the United States would assist in supporting any sort of program that the Committee on Postwar Medical Service would set up to help the situation.

On motion of Dr. Abell, seconded by Dr. Shoulders and carried, the subcommittee was empowered to act along the lines suggested in the discussion without the necessity of further reference to the whole committee.

Further Report of Subcommittee on Surplus Medical and Hospital Supplies.—At the request of Father Schwitalla, chairman of the subcommittee, Dr. Fishbein presented the following statement concerning a conference held in Washington on May 8 at which he and Dr. Irons were present as representatives of the American Medical Association on the invitation of Surgeon General Parran:

Surgeon General Parran was requested by the Surplus Property Board to assume as a function of the Public Health Service the responsibility of making recommendations regarding the disposal of strictly medical surplus supplies. The Surgeon General was reluctant to take over this duty and, since the Surplus Property Board must depend on a federal agency, it was decided to request Governor McNutt, as head of the Federal Security Agency, to appoint a special committee to include representatives of the medical profession, of the hospitals, of the dental profession, of public health and of sanitary engineering and similar professions in the health field. It is understood that Governor McNutt has agreed to appoint such an advisory committee to the Surplus Property Board.

There will be a considerable amount of surplus medical equipment. Under the law it apparently is desirable and feasible for the Surplus Property Board to designate areas in need from a medical and public health point of view and to designate the need in those areas. It was said that the material even could be given outright to a needy area. In connection with the determination of what areas may be in need, it also would be necessary to determine whether hospitals, physicians and dentists are available in the areas to use equipment provided. The facilities of the Bureau of Information should be of value in this connection.

There are certain priorities established under the law itself as to where the surplus materials may be offered—first to federal institutions, then to state and local institutions and then to nonprofit and voluntary institutions. Educational institutions on a nonprofit basis also have a priority. Then comes the question of priority for individuals, for veterans. Regulations were published about three days ago as to the manner in which opportunity will be given to all to purchase this material.

It was stated at the Washington conference that the proposed advisory committee might list the minimum equipment necessary for a physician or dentist to establish himself in a needy area, and then the Surplus Property Board could assemble such equipment and furnish it to returning veterans at a discount.

Dr. Walter L. Bierring remarked that at the Conference of State and Territorial Health Officers in Washington on April 12 Mr. Rosenfield of the Surplus Property Board, Miss Switzer and others had urged that the state and local health agencies become more active in the matter of surplus property disposal and, as a result, the conference had adopted a resolution asking Surgeon General Parran to invite representatives of various interested organizations to create some sort of agency that could be of assistance.

Major Richard J. White, who is working on the problem of surplus medical and dental supplies as far as the Office of the Surgeon General of the Army is concerned, was introduced by Father Schwitalla. Major White stated: This is an absolutely long range program; the type of equipment at first available as surplus will be field equipment, which is not the type placed in station hospitals or in army hospitals in the United States but may be and can be adapted for general hospitals; there is a lot of medical material that was procured in 1917, which was turned over to the Office of Civilian Defense; we are in no position to state what we are going to have for surplus nor when we are going to have it but are looking toward surplus in the future, the long range; we are trying to get together with interested and informed groups in medicine to try to formulate some policy; the Surgeon General's Office is in accord with everything that has been done so far; there is an excellent opportunity for some group such as the Committee on Postwar Medical Service to formulate a plan for the returning physician and dentist who wants to secure some of the surplus material to set up his own office; it might be possible for this committee to formulate a policy whereby it could be recommended to the state medical societies that they establish a special section in their state committees and have some one at the headquarters of the disposal area concerned who can act as the go-between and keep the physicians and dentists who come back from service informed as to the availability of the surplus material so that he need not go to the retailer; there will be no competitive bidding in the long range program; it would be desirable if a central buying agent could be established in each state and form a group in each state of those who would like to have something done for the doctor and dentist who wishes to set up his own office in a location of his own choice—this would take care of the individual veterans who do not come under the priority categories.

Dr. Fishbein thought the points mentioned by Major White might well be referred to the committee that is to be established by Mr. McNutt.

Father Schwitalla reminded the Committee of the report on the surplus property matter which he had presented to the Committee at the March meeting and which had been tabled. He requested authority to bring that report up to date, to withdraw the recommendations made therein and have it published. The request was granted.

Dr. Camalier said that the American Dental Association would be very glad to go along with the plans as expressed by Major White.

It was voted to request the representative of medicine on the proposed McNutt committee to bring the views set forth by Major White to the attention of that committee. Father Schwitalla stated that as chairman of the Subcommittee on Surplus Medical and Hospital Supplies he would interpret this action as a command for his subcommittee.

Report of Subcommittee on Establishment of Medical Corps in Veterans Administration.—Father Schwitalla, chairman of the subcommittee, told the Committee of a communication he had received from Mr. Watson Miller of the Federal Security Agency regarding the Rogers bill.

The Committee was informed by Dr. Fishbein that more letters had been received recently at the offices of the American Medical Association concerning the Veterans Administration and its difficulties than had been received on any subject at any previous time, that many were from physicians in service who are fearful that when they return from active duty they will be assigned to service with the Veterans Administration and that some hundreds already had been so assigned. He thought it was a function of the Committee on Postwar Medical Service to represent the medical profession in this matter and that some expression should go to the suitable government officials to the effect that these physicians enlisted in the respective branches of the armed forces and not in the Veterans Administration. He asserted that it is absolutely against everything that American medicine stands for to have these men forced into the Veterans Administration as a part of their service with the armed forces.

Dr. Irvin Abell informed the Committee that at a meeting of a special advisory committee to the Veterans Administration in March a reorganization of the service was suggested, that a subcommittee was then appointed to formulate plans for such reorganization and that a report has been prepared and is ready for presentation.

The following statement was presented by Dr. E. L. Henderson, a member of the Executive Committee of the Board of Trustees of the American Medical Association, who announced that the statement had been adopted the previous day by the Executive Committee:

In November 1944 the Army Medical Department was directed to transfer at least 300 Medical Corps officers to the Veterans Administration, this number to include those officers in the zone of the interior who were formerly employed by the Veterans Administration as civilians. Apparently about 100 men meeting the latter classification were so assigned and in addition some 200 others selected largely from among men who had been marked "limited service." Some of those thus assigned have protested and others are now protesting bitterly against these assignments on the ground that their enlistment was distinctly for military service and that assignment to the Veterans Administration cannot be thus characterized. Physicians who have served with distinction in both the European and Pacific theaters of operation are now indicating by communications addressed to the offices of the American Medical Association the fear that they may be assigned on their return to the United States to service with the Veterans Administration. The unwillingness to serve with the Veterans Administration is based not only on their belief that this cannot be considered military service but also on the point of view that competent, scientific medical care is difficult under the conditions that prevail in the veterans' hospitals.

The Committee on Postwar Medical Service, which includes representatives of the American Medical Association, American College of Surgeons, American College of Physicians, American Hospital Association, Federation of State Medical Boards, Association of American Medical Colleges, Catholic Hospital Association, Advisory Board for Medical Specialties and other groups, after careful consideration of the problems involved, urges that the Secretary of War, the Secretary of the Navy and all others concerned with the activities of physicians voluntarily enlisted in the armed forces recognize the righteousness of the protests made by these medical officers against assignment to the Veterans Administration. It is further urged that the needs of the Veterans Administration for physicians be met either by voluntary enrolment of men in the armed forces at the time of their release from the service or by recruitment of medical personnel from civilian sources.

The statement presented by Dr. Henderson was unanimously adopted by the Committee on Postwar Medical Service. (Since the meeting of the Committee on May 12, the foregoing statement has been forwarded by telegraph to the Secretary of War and to the Secretary of the Navy and was printed in the editorial columns of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION for May 19, 1945.)

It was brought out by Dr. Barton in the discussion on the Veterans Administration that there is an agreement in the offices of the Veterans Administration that attention will be paid to the expressed desire of a returning medical officer to go to a community of need before he may be assigned to duty with the Veterans Administration. It was the opinion of the members of the Committee that the medical officers themselves know nothing about such an agreement.

Report of Subcommittee on Formulation of Lists of Medical Officers to Be Considered for Demobilization.—Dr. Frederick A. Coller, chairman of the subcommittee, presented the following report:

On April 21 there was a joint meeting in Washington of the directing board of the Procurement and Assignment Service and the Subcommittee on Formulation of Lists of Medical Officers to be Considered for Demobilization, which was represented by Dr. Coller, chairman, Dr. Bloedorn for Dr. Zapffe, Dr. Shoulders, Lieutenant Colonel Lueth and Father Schwitalla. It was intimated that the Surgeon General of the Army would be willing to consider for discharge a small selected list of essential teachers. This subcommittee was requested to obtain such a list through Dr. Zapffe. In brief, it was agreed that the list should be in three categories for each school: first, those most urgently needed; second, those who are desirable but somewhat less urgently needed, and, third, important teachers but still less urgently needed. In each categosy it was agreed that each school should limit the number of names submitted to 5 per cent of those of its teachers who were in service and that in any case no more than five names should be listed in each category.

The problem of the civilian need for physicians was discussed, and it was felt that the Procurement and Assignment Service was closely in touch with civilian needs through information received from its state chairmen. It was felt that the relation between the state chairmen and the central office of the Procurement and Assignment Service might be tightened so that information concerning such needs could be presented to the Surgeon General of the Army through the Procurement and Assignment Service as soon as such needs occur.

The need of industry for physicians did not seem to be pressing at the time. We were informed that there had been very few requests sent to the Procurement and Assignment Service for aid in this field and that should such needs occur they will be handled by the Procurement and Assignment Service as heretofore.

As far as the subcommittee is able to make out, there has been no important shortage of physicians in the public health field. However, to clarify this situation it was determined that Dr. Victor Johnson would write a letter to the public health officers of the states to obtain factual evidence concerning the needs as they exist in this field.

Dr. Zapffe reported that letters requesting the names of faculty members now in service whom the medical schools thought absolutely necessary to be returned were sent to the seventy-eight approved medical schools, that fifty-five replies had been received and that there are about 200 men on the lists who are urgently needed. Dr. Coller stated that the deans of some medical schools had had a communication from Surgeon General Kirk asking for lists of ten faculty members whom they would like to have returned and the order in which they wish them, and that confusion was created as the result of this duplication. General Rankin stated that practically all of the medical schools had replied to the Surgeon General's letter, that it is not at all certain the plan can be worked out and that both the lists obtained through the direct communication of the Surgeon General and those submitted by the Committee on Postwar Medical Service will be used.

There was considerable discussion on the methods to be used in the screening of the lists of needed faculty members, and it was decided that the lists obtained through the efforts of the subcommittee should be turned over to Colonel Lueth for use by the Surgeon General.

The report of the subcommittee was accepted and the committee continued.

Question of Further Distribution of Information on Topics Considered by the Committee on Postwar Medical Service.—The Chairman stated that in his opinion publication of the minutes of the Committee's meetings had been valuable. He informed the members that a bibliograpy of all pertinent material which has appeared in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION has been prepared and that copies are available to any one interested. Copies of the bibliography were distributed among those present. He further stated that suggestions for further publicity would be welcomed.

Refresher Courses for Medical Officers in Foreign Countries.—Colonel Lueth reported that from personal letters it appeared that attempts were under way to give refresher courses for medical officers in Europe as a part of the educational program of the Army. It is believed such refresher courses will be continued in the near future. Definite information concerning this work will be given at a later time.

Situation of the Medical Profession in the Philippines.—The Chairman presented a letter that had been received from a medical officer now on duty in the Philippines in which concern was expressed as to what the profession in the United

States might do to aid the rehabilitation of medical education and the practice of medicine in the Philippines.

It was the consensus of the Committee that all possible aid should be given but that no immediate plans can be made until the entire situation is clarified. Measures are now being taken to obtain first hand information.

Report of Subcommittee on Graduate Education of Physician Veterans.—Father Schwitalla, chairman of the subcommittee, presented the following progress report, which he stated had been approved via telephone by Mr. H. V. Stirling of the Veterans Administration and was ready for release:

PROGRESS REPORT OF SUBCOMMITTEE ON GRADUATE EDUCATION OF PHYSICIAN VETERANS

A meeting took place in the office of Mr. H. V. Stirling, director, Vocational Rehabilitation and Education Service of the Veterans' Administration, on Saturday afternoon, April 21, 1945. The meeting was attended by Mr. Stirling and three members of the Subcommittee on Graduate Education of Physician Veterans, namely, Dr. Victor Johnson, Lieut. Col. Harold C. Lueth and Father Alphonse M. Schwitalla, S.J.

The purpose of the meeting was to bring before Mr. Stirling a number of questions which had been raised concerning the application of the educational provisions of the G. I. bill to the residencies in hospitals, particularly in nonuniversity hospitals.

NUMBER OF VETERANS NOW IN EDUCATIONAL PROGRAMS UNDER PUBLIC LAWS 16 AND 346

As of the end of February 1945 there were in training under Public Law 16 a total of 11,937 (21 per cent) trainees, 11,673 (21 per cent) cases were pending, 29,464 (52 per cent) had been denied training or were temporarily deferred from training and 3,128 (5 per cent) had terminated their training, the total in all groups being 56,202.

Under Public Law 346 as of the same date there were in industrial training 12,583 veterans, in institutional programs 17,029 and in "on the job" training 554. Of those in institutional courses 589 were in "below college" programs, 301 in junior colleges, 406 in teachers colleges, 12,331 in colleges of arts and sciences and 3,402 in trade schools. The number who discontinued their training is 2,679; of this number 181 had completed the work which they began, 854 interrupted it voluntarily, 1,052 discontinued the program voluntarily, 86 were declared unsatisfactory for their programs and 505 transferred from opportunities under Public Law 346 to opportunities under Public Law 16. No figures were specifically available for persons training in schools of medicine or dentistry at the present time.

NUMBER OF VETERANS CHOOSING MEDICINE AND DENTISTRY

Mr. Stirling was good enough to supply information concerning present trends in the number of applications for medicine and dentistry and allied fields among the persons who had come under his office, that is, under the Vocational and Rehabilitation Service. One study had been made of a total of 9,359 applications approved by the regional offices under Public Law 16. In this group there were 38 applications requesting an opportunity to study dentistry, 81 to study pharmacy, 59 to study medicine and 18 to study chiropractic or osteopathy.

In another study of the applications under Public Law 346, two groups of 5,000 applications as approved by the state agencies were each analyzed with the results given in the accompanying table.

Analysis of Applications

Applications for:	In the First Group of 5,000	In the Second Group of 5,000
Predentistry	14	18
Dentistry	530	503
Medicine	184	203
Premedicine	69	82
Pharmacy	34	37
Chiropractic	17	18
Osteopathy	2	3
Chiropody	4	7

GENERAL STATISTICS ON VETERANS' EDUCATION

A fairly complete statement concerning the general statistics on veterans' education is contained in Bulletin No. 80, Higher Education and National Defense, of the American Council on Education, March 27, 1945, page 6:

"During January 1945 the number of veterans entering on training Public Law 16 was 3,872 as compared with only 2,138 new trainees under Public Law 346. In February the numbers were 1,261 and 2,027 respectively. It is significant that the number enrolling during February, when the second semester begins in many colleges, was only 2,391 under the two acts. While the relative numbers were reversed for the two months, the larger number for January and February combined came under Public Law 16. If this trend continues there will be more veterans in colleges and universities under the vocational rehabilitation program than under the G. I. bill until the beginning of demobilization of large numbers of nondisabled veterans."

Statistics such as these are obviously of great value to medical educators and hospital executives for their planning.

TUITION CHARGE MADE BY HOSPITALS

Mr. Stirling was asked whether any change had been made in the provisions previously announced in the Committee's memorandum of Oct. 16, 1944. It was there stated as follows: "The law provides that if the institution has no established tuition fee, or if the administrator deems the established tuition fee to be inadequate compensation, the administrator is authorized to provide for the payment; again, however, with the $500 ordinary school year limitation." Mr. Stirling said that there has been no change with reference to this provision and that, therefore, a hospital may charge tuition for a residency.

Mr. Stirling's attention was called to Mr. McCarran's bill, S. 181, introduced on March 22, 1945 and now in the hands of the Committee on Finance of the Senate, the essential provision of which reads as follows: "And provided further, that if a publicly supported institution or private institution exempt from tax under section 101 (6) of the Internal Revenue Code has no established tuition fee, or if the established tuition fee of any such institution is less than the actual cost to such institution of furnishing the education or training, the administrator is authorized to provide for the payment to such institution, with respect to any such person, of the actual cost of furnishing such education or training but not to exceed $500 for an ordinary school year." Mr. Stirling commented that this was essentially the understanding which he had of the intent of the Servicemen's Readjustment Act of 1944.

PAYMENT OF SALARIES TO RESIDENTS UNDER THE G. I. BILL

Mr. Stirling was then asked whether the previous understanding of the Committee that veterans who are appointed residents in hospitals but who participate in the benefits of the G. I. bill may continue to receive a salary from the hospital. Mr. Stirling replied that there is no question in his mind but that nothing in Public Law 346 prevents either the payment of a salary by the hospital or the acceptance of a salary by the resident, provided the limitations which are recognized under Public Law 16 are applicable also under Public Law 346. He felt, however, that there should be no difficulty whatever in meeting the provisions to which he refers. The particular provision of Public Law 16 reads as follows: "That when the course of vocational rehabilitation furnished to any person as herein provided consists of training-on-the-job by an employer, such employer shall be required to submit monthly to the administrator a statement under oath showing any wage, compensation or other income paid by him to such person during the month, directly or indirectly and based on such sworn statements, the administrator is authorized to reduce the pension of such person to an amount considered equitable and just, but not below the amount of pension or retirement pay to which he would be entitled for service connected disability if not following a course of vocational rehabilitation." In a memorandum of the Veterans Administration of Public Law 16 dated Dec. 15, 1943 managers are authorized to reduce the pension of a person when the employer-trainer pays wage or compensation in whole or in part if the sum thus paid "when added to the increased pension exceeds the minimum entrance wage paid by the employer-trainer to an employee in the particular job for which the person is being trained." A provision which bears on this point is found in the Veterans Administration Instruction No. 2, dated Jan. 18, 1945, page 8, paragraph 19 (b), which reads as follows:

"Where the veteran is receiving compensation for productive labor, performed as part of his apprenticeship or other training on the job, the amount of subsistence when added to his current monthly salary or wage, based on the standard work week exclusive of overtime, shall not be in excess of the standard beginning salary or wage payable to a journeyman workman in the occupation or trade in which training is being given, similarly based on the standard work week exclusive of overtime."

THE ADMINISTRATOR'S SPECIAL COMMITTEE ON VOCATIONAL REHABILITATION, EDUCATION AND TRAINING PROBLEMS

Mr. Stirling kindly supplied the names of those who are serving as members of the Administrator's Special Committee on Vocational Rehabilitation, Education and Training Problems. The committee members are as follows:

Dr. Arthur Andrews, president, Grand Rapids Junior College, Grand Rapids, Mich.

Dr. Horace S. Ford, treasurer, Massachusetts Institute of Technology, Cambridge, Mass.

Dr. R. W. Kent, director, Essex County Vocational Schools, Newark, N. J.

Dr. Thurman D. Kitchin, president, Wake Forest College, Wake Forest, N. C.

Dr. Robert G. Sproul, president, University of California, Berkeley, Calif.

Dr. Robert B. Stewart, comptroller, Purdue University, LaFayette, Ind., chairman of the committee.

Dr. Rufus C. Harris, president, Tulane University, New Orleans.

Perhaps attention might be called to the desirability of adding to this special committee the names of an educator or of educators who are familiar with the medical aspects of the many educational problems with which the Veterans Administration is now dealing.

STUDENTS OF NONAPPROVED SCHOOLS

The question was asked whether nonapproved schools of medicine were receiving student veterans under the G. I. bill. The members of the subcommittee are completely satisfied that, from such information as is now available, no serious difficulty need at present be foreseen.

Approval Agencies for Institutions in the States

Mr. Sterling was asked whether he could furnish to the Committee a list of the organizations functioning in the various states as the approval agencies for institutions approved as qualified and equipped to furnish training to veterans under Public Law 346. He was kind enough to accede to this request and furnished the accompanying list, indicating, however, that in many instances "there has been no specific designation by the governor of the approval agency in a given state." Mr. Stirling's list has been compiled from the best information available and represents the conditions up to April 30, 1945.

The report was accepted and the subcommittee continued.

Informational Reports.—Wartime Graduate Medical Meetings: Dr. F. F. Borzell reported for the Central Committee of the Wartime Graduate Medical Meetings that the work of that committee continues to be received enthusiastically but that some difficulty is now being encountered in finding speakers for the Army, Navy and Air Corps refresher courses.

Approval Agencies

State	Agency
Alabama	Department of Education
Arizona	Department of Public Instruction
Arkansas	Department of Education
California	Department of Education; Division of Readjustment Education
Colorado	Governor's Advisory Committee on the Education and Training of War Veterans
Connecticut	Department of Education
Delaware	Department of Public Instruction
Dist. of Columbia	Board of Education
Florida	Department of Education
Georgia	State Veterans Education Council
Hawaii	Department of Public Instruction
Idaho	State Department of Education
Illinois	Office of Public Instruction
Indiana	State Department of Public Instruction
Iowa	Department of Public Instruction
Kansas	Kansas Committee on Institutions for Veteran Training
Kentucky	State Department of Education
Louisiana	State Department of Education
Maine	Commissioner of Education
Maryland	State Department of Education
Massachusetts	State Department of Education; Board of Collegiate Authority
Michigan	State Department of Public Instruction
Minnesota	Department of Education
Mississippi	Department of Education
Missouri	State Department of Education
Montana	State Superintendent of Public Instruction
Nebraska	Department of Public Instruction
Nevada	State Department of Education
New Hampshire	State Board of Education
New Jersey	State Department of Economic Development; Division of Veterans Affairs
New Mexico	State Planning Board
New York	University of the State of New York; State Education Department
North Carolina	Department of Public Instruction
North Dakota	State Board of Higher Education (Colleges); State Department of Public Instruction (Public Schools)
Ohio	State Department of Education
Oklahoma	Department of Public Instruction
Oregon	State Department of Education
Pennsylvania	Department of Public Instruction
Puerto Rico	Department of Education
Rhode Island	Department of Education
South Carolina	Department of Education
South Dakota	Department of Public Instruction
Tennessee	State Department of Education
Texas	State Committee for Veterans Training
Utah	Office of the Governor
Vermont	State Department of Education
Virginia	State Board of Education
Washington	State Board of Education
West Virginia	State Department of Education
Wisconsin	Veterans Recognition Board
Wyoming	State Department of Education
Alaska	(No agency designated)
Panama Canal	(No agency designated)
Virgin Islands	(No agency designated)

Federation of State Medical Boards: Dr. Walter L. Bierring stated that the Federation had received a number of inquiries from graduates of unapproved schools who have served as medical officers in the armed forces as to whether their military service would be given special consideration when they applied for licensure in those states where graduates of unapproved schools are not eligible at the present time.

Time and Place of Next Meeting.—It was decided that the next meeting of the Committee should be held at American Medical Association Headquarters in Chicago on Saturday, June 23, 1945.

The meeting adjourned at 1:13 p. m.

H. H. Shoulders, M.D., Secretary.

ECONOMIC ASPECTS OF FUTURE MEDICAL PRACTICE

Lieutenant Colonel Harold C. Lueth
Surgeon General's Liaison Officer
MEDICAL CORPS, ARMY OF THE UNITED STATES

The Committee on Postwar Medical Service mailed a questionnaire to all medical officers on duty requesting information as to their desires in regard to future practice. Previous studies of the answers contained in the 21,029 questionnaires returned have appeared in The Journal.[1] One set of questions referred to economic aspects of medical practice, and the results are discussed in this paper.

Type of Medical Practice Desired

There were 4,326 medical officers who indicated a desire to engage in general medical practice after release from service. This constituted only about three fourths of those who entered the armed forces from general practice. Nearly two thirds of all medical officers, 12,627, indicated that they were interested in special medical practice in the future. They were about equally divided between those who expressed a desire to engage solely in specialty practice, 6,456, and those who expressed a desire to engage in specialty practice combined with part time teaching, 6,171.

Medical officers who were interested solely in future specialty practice seemed to favor communities of 25,000 to 250,000 population. There were only 27 who wanted to go to communities of less than 2,500, 906 who wanted to go to communities of 2,500 to 25,000, 2,539 who wanted to go to communities of 25,000 to 250,000 and 949 who wanted to go to communities of more than 250,000 population. Nearly one third of the group of medical officers gave no indication of the preferred size of community.

There were 2,821 medical officers who expressed a desire to engage in medical practice on a full time basis. Included in this group were 278 men who desire to become full time teachers.

Acceptable Monthly Salaries

One of the questions asked was "What is the minimum monthly salary you would accept on a salary basis?" A wide range of answers was given. The median monthly salary mentioned was $583. There were 1,485 medical officers who would accept a monthly salary of $400 to $499, 2,610 medical officers who would accept a monthly salary of $500 to $599 and 1,090 medical officers who would accept a monthly salary of $600 to $699. There was fairly even distribution among the various graduation groups.

Voluntary Redistribution of Medical Officers

Eleven per cent, or 2,364 medical officers, expressed willingness to go to a different community than that from which they came if a subsidy was provided for several months. About 13 per cent of medical officers (2,817) stated that they would be willing to go to an area needing physicians if there was an office established. More than 15 per cent (3,284 medical officers) were willing to move to an area in need of physicians if diagnostic facilities were available. Nearly 29 per cent (6,091) would go to a community in need of a doctor if there were hospital facilities. The proportions in each graduation group who would go to a community needing physicians with office established, subsidy provided, diagnostic facilities or hospital facilities were about equal.

A few men wanted to go to communities of less than 2,500 population. There were 41 who would go if a subsidy was provided, 43 if there were diagnostic facilities, 56 if an office was established and 74 if there were hospital facilities available. About one fifth of all men who were willing to relocate wished to go to cities of 2,500 to 25,000 population. Six hundred and forty-three medical officers would go to such cities if there was an office established, 531 medical officers if there was a subsidy

1. Lueth, H. C.: Postgraduate Wishes of Medical Officers: Final Report on 21,029 Questionnaires, J. A. M. A. **127**: 759-770 (March 31) 1945; The Medical Officer Returns to Civilian Practice, ibid. **127**: 1039-1043 (April 21) 1945; The Medical Officer and Future Industrial Practice, ibid. **128**: 93-95 (May 12) 1945; Results of Pilot Questionnaire to Physicians in Service, ibid. **125**: 558-560 (June 24) 1944.

provided, 710 if there were diagnostic facilities and 1,327 if there were hospital facilities.

Many men gave no indication of the size community they would go to but said they would go if an office was provided (631), a subsidy was provided (481), diagnostic facilities were provided (641) and hospital facilities were provided (1,166).

FULL TIME MEDICAL PRACTICE

About 85 per cent of medical officers indicated that they did not desire to remain in government service. Medical officers of the regular medical corps or governmental agencies were considered separately and constituted a group of 532 officers. There were 237 Regular Army officers, 181 Regular Navy officers, 15 United States Public Health Service officers, 10 Regular Veterans Administration officers and 4 regular officers from other governmental agencies who indicated their desire to remain in government service, or a total of 2,501. In addition, 49 regular officers stated that they did not want to remain in government service.

Of Reserve officers 672 men were willing to accept army service. Naval medical service attracted 406 officers. About the same number of men (411) chose the United States Public Health Service. There were 435 medical officers who desired service with the Veterans Administration. About one third of these officers graduated from medical school before 1930.

GROUP AND PRIVATE PRACTICE

The questionnaires of medical officers were divided into several categories—those wanting to reengage in individual private practice (8,041), those not desiring to reengage in private practice (1,345), those desiring private practice with a group (10,994) and those who gave no indication of their wishes (649). The distribution by graduation groups is shown in the accompanying table.

Answers to Group Practice Question

Graduation Group No.	Dates of Graduation	Want to Reengage in Private Practice *	Do Not Desire to Reengage in Private Practice	Desire Private Practice with a Group	No Indication of Wishes	Total
1	1941-1943	1,432	181	2,638	142	4,393
2	1938-1940	1,422	198	2,461	124	4,205
3	1935-1937	1,472	180	2,052	58	3,762
4	1930-1934	1,990	302	2,304	119	4,724
5	1920-1929	1,522	287	1,396	115	3,320
6	Before 1920	194	197	143	91	625
Total.....		8,041	1,345	10,994	649	21,029

* No indication as regards group practice. It also includes men who want to enter private practice.

CONCLUSIONS

1. More than one fourth, or 5,785 (27.4 per cent) medical officers, were formerly in general medical practice. The smallest number of men (624) came from communities of less than 2,500 population and more than three times that number came from cities of 2,500 to 25,000, cities of 25,000 to 250,000 and cities of over 250,000.

2. About one third (7,282 medical officers) had been in special practice in civilian life. More than three fourths of the specialists came from large cities, and many had been certified by American boards.

3. There were 4,326 medical officers who indicated a desire to engage in general medical practice, or only about three fourths of those who came from general practice to duty with the armed forces. In contrast, more than half again as many men who were originally in specialty types of practice before coming to duty (7,282) indicated that they would like to engage in specialty practice after the war (12,627). Medical officers interested in future specialty practice seemed to favor communities of 25,000 to 250,000 population.

4. A wide range of answers was given to the question as to the minimum acceptable monthly salary that medical officers would accept in the future. The median monthly salary was $583, and there were slight variations for the different sized communities and larger variations between the different graduation groups.

5. Eleven per cent (2,364 medical officers) were willing to go to a new community in need of physicians if a subsidy was provided for several months. About 13 per cent of medical officers, or 2,817, stated that they would be willing to go to an area needing physicians if there was an office established. More than 15 per cent, or 3,284 medical officers, would go to such areas if there were diagnostic facilities, and nearly 29 per cent, or 6,091, if there were hospital facilities. In general a larger number of young men indicated their willingness to locate in new areas than older medical officers.

6. About 85 per cent of medical officers indicated that they did not desire to remain in government service.

7. Private practice, either individually or as part of a group, was the choice of more than four fifths of medical officers. There were 8,041 medical officers who expressed a desire to engage in the individual private practice of medicine and 10,994 who desired to engage in private practice as a member of a group.

Medical Legislation

MEDICAL BILLS IN CONGRESS

EMIC Program

H. J. Res. 212 has passed the House and Senate, appropriating an additional $2,200,000 to provide medical, nursing and hospital maternity and infant care for the wives and infants of enlisted men during the remainder of the present fiscal year, which will end June 30. There is pending in the Senate Committee on Appropriations the regular appropriation bill for the Labor Department, which will make available for this program $44,189,500 for the fiscal year beginning July 1.

Dental Health

Three identical bills have been introduced to provide assistance to states in developing and maintaining dental health programs, S. 1099, introduced by Senator Aiken, Vermont, for himself and Senator Pepper, Florida, H. R. 3414, introduced by Representative Traynor, Delaware, and H. R. 3412, introduced by Representative Brehm, Ohio. This legislation would create a National Dental Health Council and would authorize for each fiscal year a sum sufficient to enable the Surgeon General of the United States Public Health Service: (1) to assist, through grants and as otherwise provided, states and political subdivisions in establishing and maintaining adequate measures for the prevention, treatment and control of dental diseases and the development and maintenance of effective means for the education of the public concerning such diseases; (2) to make available to states and political subdivisions and to educational institutions and other nonprofit agencies grants for approved studies, investigations and demonstrations in dental health care and education projects; and (3) to conduct studies and demonstrations and to collect information relative to the prevention, treatment and control of dental diseases.

Official Notes

DOCTORS LOOK AHEAD

Remaining programs in the series of network broadcasts by the NBC and the American Medical Association will be on the air June 23 and 30 except in Chicago.

Doctors Look Ahead is broadcast each Saturday at 4:30 p. m. Eastern War Time (3:30 p. m. Central War Time, 2:30 p. m. Mountain War Time, 1:30 p. m. Pacific War Time) except in Chicago, where each week's program as broadcast on the network will be heard on the next Saturday afternoon at 3 p. m. Central War Time.

The programs remaining are as follows:

June 23. Postwar Doctor: Problems in medical education and their influence on the public health. Guest speaker Dr. Victor Johnson, Secretary, American Medical Association Council on Medical Education and Hospitals.

June 30. Health in Schools: A program devoted to health education and related topics in our schools, where doctors look ahead to greater progress in the next decade. Speaker Dr. Charles E. Wilson, Teachers College, Columbia University, speaking from New York.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARKANSAS

Dr. Ross Reappointed Health Officer.—Dr. Thomas T. Ross, state health officer, Little Rock, was reappointed for a four year term when the state board of health met in quarterly session April 19. His new term begins July 1, it is reported.

District Meeting.—The Fifth Councilor District Medical Society was addressed in Magnolia, May 22, by Drs. William Decker Smith, Texarkana, and Stanley George Wolfe, Shreveport, La., on "The Gastroscope—Its Use in the Examination of the Stomach" and "Plasma Fractionation—Its Use in the Diagnosis and Treatment of Disease" respectively.

COLORADO

Dr. Parran Addresses Open Meeting.—Dr. Thomas Parran, Surgeon General of the U. S. Public Health Service, addressed an open meeting of physicians and interested lay persons under the auspices of the Colorado State Medical Society at the Shirley-Savoy Hotel, Denver, May 24. His subject was "Pending Legislation Relative to Public Health and Hospitals for the Future." The talk was a feature of a two day meeting of the Colorado Public Health Association which was being conducted by a team of speakers sponsored by the American Public Health Association. These speakers included Drs. Karl F. Meyer, San Francisco, and George M. Wheatley, New York, on "Legislative Proposals for Medical Care in California" and "Rheumatic Fever and Its Public Health Significance" respectively.

DISTRICT OF COLUMBIA

Personal.—Dr. Daniel L. R. Borden has resigned as chairman of the district board of police and fire surgeons, effective April 16. Dr. Borden has been on leave from the board since 1941, when he entered military service.

The Curtis Lecture.—Dr. Ulysses Grant Dailey, Chicago, delivered the fifth annual Austin M. Curtis Memorial Lecture before the faculty and students of Howard University College of Medicine, Washington, May 28, on "Treatment of Thyrotoxicosis."

Clinical Society Inaugurates Distinguished Service Award.—The Georgetown Clinical Society on April 19 presented its first G award for distinguished service in the practice of medicine or surgery to Comdr. Joseph J. Mundell (MC) at a dinner meeting in the Statler Hotel. This was the first presentation of the new annual award to be given in the form of a G plaque and an inscribed certificate to be made to an alumnus of the Georgetown University School of Medicine who distinguished himself in private practice and in service to the school of medicine. Commander Mundell graduated at Georgetown in 1903 and has been practicing in the district for thirty-nine years. For the past eleven years he has been professor and head of the department of obstetrics at Georgetown. He helped found the Georgetown Clinical Society in 1906.

FLORIDA

Annual Graduate Short Course.—The thirteenth annual graduate short course for physicians will be held June 25-30 at the George Washington Hotel, Jacksonville. The first three days will be devoted to medicine and the last three to surgery. Preliminary plans call for the following faculty:

Dr. Eugene A. Stead Jr., professor of medicine, Emory University School of Medicine, Atlanta, Medicine.
Dr. Robert L. Sanders, associate professor of surgery, University of Tennessee College of Medicine, Memphis, Surgery.
Dr. Herbert C. Miller Jr., Yale University School of Medicine, New Haven, Pediatrics.
Dr. Oren Moore, dean of obstetrics, Southern Pediatric Seminar, Charlotte, N. C., Obstetrics.
Dr. Edwin C. Hamblen, chief of division of endocrinology, Duke University School of Medicine, Durham, N. C., Gynecology.
Surgeon Richard C. Arnold, U. S. Public Health Service, venereal disease research laboratory, Staten Island, N. Y., Venereal Diseases.

Additional information may be obtained from Dr. Turner Z. Cason, Jacksonville, director of the department of medicine, Graduate School, University of Florida.

Oldest Medical Society in State.—On May 25 the Duval County Medical Society observed its ninety-second anniversary. The society was created in 1853, eight years after Florida became a state, and was the first component society of the state medical association to be established. Its first officers were the late Drs. John S. Murdoch, president; W. J. L'Engle, secretary, and Richard P. Daniel, treasurer. The state medical journal reports that apparently there were no other county medical societies in Florida until after the war between the states. In a history prepared by Dr. J. Webster Merritt, Jacksonville, it is shown that the late Dr. James Hall represented the profession in and around Jacksonville for a quarter of a century before the Floridas, east and west, were ceded to the United States by Spain. His successor, the late Dr. A. S. Baldwin, arrived in Jacksonville in 1838, and the Duval County Medical Society was created at his instigation in 1853. The medical history written by Dr. Merritt is now being published serially in the *Journal of the Florida Medical Association*.

GEORGIA

New Law Asks Parents to Register Births.—On July 1 a law will become effective making the registration of births the responsibility of the parents. The medical attendant will be responsible for supplying the medical record. *Georgia's Health* believes that parent participation will result in better and more accurate reporting. Two particular advantages will be obtained from the filing of a separate medical report, it was stated. Medical information useless to the lay person will be removed from the legal certificate. Second, because it is a confidential report, the physician may report medical items of public health interest without prejudicing the interests of his patient.

Report of Warm Springs Foundation.—During the fiscal year 1944, 543 patients received 36,549 hospital days' care at the Georgia Warm Springs Foundation, according to its annual report. Of the total, 289 received financial assistance, this group receiving 22,852 hospital days' care, or 62.52 per cent of the total hospital days' care. The average daily number of patients in residence throughout the year was 100. Newspapers reported recently that a syndicate of life insurance companies is making payments to the foundation on a $560,000 policy taken out by the foundation in 1930 on the life of Franklin D. Roosevelt, then governor of New York. The foundation paid the premium and also was the beneficiary, it was stated.

ILLINOIS

House Committee Urges Passage of Pure Food Bill.—A bill providing for state control of food, drug and cosmetic standards and advertising in intrastate commerce was recommended for passage May 28 by the house committee on public health. Similar measures were sponsored in 1941 and 1943, but this is said to be the first time that the bill was reported to the floor of the house.

Payment of Physicians' Bills for Employees.—S. DeWitt Clough, president and general manager, announces a plan for payment of physicians' bills for employees of Abbott Laboratories, North Chicago, according to *Industrial Medicine*. Employees will be reimbursed for physicians' bills incurred in the hospital, at home or at the doctor's office. The entire cost of the program, which will benefit approximately 2,800 employees of the laboratories and its seventeen branches in the United States and Canada, will be paid by the company. Under a medical expense plan, which is underwritten by Equitable Life Assurance Society of the United States, an employee will be repaid up to $2 for each visit to a doctor's office or at a hospital and up to $3 for each visit by a physician to the employee's home. Payment will be limited to one visit each day and to a maximum of fifty visits in any one calendar year.

Chicago

Ninety-Four Years of Age.—On May 23 Dr. Samuel Collins Buchan observed his ninety-fourth birthday. Dr. Buchan graduated at Bellevue Hospital Medical College, New York, in 1877 and came to Chicago in 1919.

Gilbert Wynekoop Released from Mental Hospital.—According to newspaper reports, Dr. Gilbert H. Wynekoop was held sane and released from the Illinois Security Hospital at Menard on a writ of habeas corpus issued by Judge L. P. Harris in the circuit court of Randolph County May 17. In 1934 the Illinois state department of registration revoked his license because he had been adjudged insane.

Nathanson Denied Court Review.—The U. S. Supreme Court on June 4 denied a motion for review of the case of Dr. Frank L. Nathanson, who in May 1942 was convicted of conspiracy to commit abortion. At the time he was sentenced by John A. Sbarbaro, then a judge of the criminal court, to a year in the county jail and to pay a fine of $2,000. He was released on a $5,000 bond pending his appeal. His conviction followed the testimony of a woman who claimed that Nathanson had performed an abortion on her. He is said to have been arrested on similar charges eight times previously. Newspapers reported that the appellate court upheld the conviction on Dec. 17, 1943 and the state supreme court upheld it on January 18 of this year.

Special Society Elections.—At the annual meeting of the Chicago Gynecological Society, May 18, the following officers were chosen: Drs. James E. Fitzgerald, president; Ralph A. Reis, president-elect; Eugene A. Edwards, vice president; Herbert E. Schmitz, secretary, and Henry Buxbaum, treasurer.——New officers of the Chicago Society of Internal Medicine elected May 21 include Drs. Samuel Soskin, president; Laurence E. Hines, vice president, and Howard L. Alt, secretary-treasurer.——Dr. Frederick W. Schacht was elected president of the Chicago Urological Society at its annual meeting on May 24, Dr. Harry J. Dooley vice president and Dr. James W. Merricks secretary-treasurer.——The Chicago Orthopaedic Society recently chose Dr. Charles N. Pease president-elect. Other officers include Drs. Walter R. Fischer, president; Arthur H. Conley, vice president; John R. Norcross, secretary and Manley A. Page, assistant secretary.

INDIANA

Executive Secretary for Indianapolis Medical Society.—Ray E. Smith, Indianapolis, a member of the state board of tax commissioners, has been appointed executive secretary of the Indianapolis Medical Society, a newly created position. Mr. Smith, whose resignation from the tax board was effective June 1, will serve as assistant to Mr. Thomas A. Hendricks, executive secretary of the Indiana State Medical Association, dividing his time between the two offices.

KENTUCKY

Hospital Construction Program.—On May 17 Governor Simeon S. Willis signed an $84,000 contract with three architects to draft plans for construction of five tuberculosis hospitals, one each in Madisonville, first district; Paris, third; Ashland, fourth; London, fifth, and Glasgow, sixth. Existing facilities in Louisville in the second district were embraced in forming the areas, explains the Hopkinsville *New Era* in discussing the districts set up by the 1944 general assembly in creating the tuberculosis sanatorium commission. The legislature set aside $1,500,000 to start construction and empowered the commission to determine which sanatorium would be constructed first. It is expected that each hospital will have about 100 beds.

MARYLAND

New Bacteriologist at Maryland.—Oscar N. Allen, Ph.D., professor of bacteriology and plant pathology at the University of Hawaii, Honolulu, since 1940, has been appointed head of the department of bacteriology at the University of Maryland, College Park. Dr. Allen succeeds Lawrence H. James, Ph.D., who has opened a consulting laboratory in Chicago.

De Lamar Lecture in Hygiene.—Dr. George Baehr, clinical professor of medicine, Columbia University College of Physicians and Surgeons, New York, gave the De Lamar Lecture in Hygiene at the Johns Hopkins University School of Hygiene and Public Health, May 17. His subject was "Medical Service Under the Health Insurance Plan of Greater New York."

MASSACHUSETTS

Physician Honored.—Dr. Alice S. Woodman, associate professor of histology and embryology and for thirty-eight years a member of the faculty of the Boston University School of Medicine, was honored at a special gathering by students and members of the faculty recently to mark her retirement at the end of June. Dr. Woodman graduated at Boston in 1903.

Diabetes Mellitus in Relation to General Medicine.—A graduate course will be conducted at the New England Deaconess Hospital, Boston, July 9-11 and October 1-3, on "diabetes mellitus in relation to general medicine." It will consist of ward teaching and didactic presentation of such topics as pathology of diabetes, alloxan and experimental diabetes, treatment with diet and the various insulins, hypoglycemia, diabetes in childhood and pregnancy, cardiovascular disease, management of complications including gangrene, pulmonary diseases, ocular and dermatologic lesions, diabetic neuropathy and ketosis and the treatment of diabetic coma. Instructors of the course will include Drs. Elliott P. Joslin, Howard F. Root, Priscilla White, Charles Cabell Bailey, Shields Warren, Leland S. McKittrick, John Herbert Waite, William P. Beetham, Richard H. Overholt, Arthur M. Greenwood, Orville T. Bailey and George W. Thorn, Harry C. Trimble, Ph.D., and Thorne M. Carpenter, Ph.D. Applications for the course should be made to the assistant dean, course for graduates, Harvard Medical School, Boston 15.

MICHIGAN

New Academy of Medicine.—The Southwestern Michigan Academy of Medicine was formally organized in St. Joseph, May 11, to bring to members of the profession in Berrien County prominent speakers. According to the St. Joseph *Herald Press* the new group is not to supplant the existing Berrien County Medical Society in any way. Officers of the new academy of medicine include Drs. Donald W. Thorup, Benton Harbor, president, and Robert C. Conybeare, Benton Harbor, secretary.

Campaign on Rheumatic Fever.—The Michigan State Medical Society and the Michigan Crippled Children's Commission are planning to launch a statewide campaign against rheumatic fever July 1. The two groups have been sponsoring a program in seven counties of the upper peninsula for the past two years. Patients were treated with the sulfonamides, and the experiment has proved sufficiently successful to carry on the statewide program with special emphasis in the congested areas. Every facility of the Michigan Crippled Children's Commission and of the state society is to be made available to the family physician, who will be invited to make full use of the commission's resources for blood and heart tests and for taking roentgenograms. The commission will pay the cost of care for children whose families are financially unable to meet the usual charges, which frequently are high because of the long hospitalization and convalescent period. In the cases in which private physicians cannot devote much time because of the long convalescent stage he may refer his patients to the pediatricians associated with the commission. Present plans call for a closer supervision of the sick child, special consultation service of pediatricians and cardiologists and follow-up care in the family.

NEW JERSEY

Division of Migrant Labor.—*Industrial Hygiene News Letter* reports the establishment of a division of migrant labor in the New Jersey Department of Labor to cooperate with the state department of health in prescribing minimum standards for sanitation and preventive and curative health centers for migrant workers. Through the state department of health, the commissioner of labor will provide essential medical, clinical, and hospital facilities; through the state director of health, he will exercise powers of a local health officer with respect to communicable diseases in migrant camps.

State Medical Election.—Dr. Frank G. Scammell, Trenton, was chosen president-elect and Dr. Samuel Alexander, Park Ridge, was installed as president of the Medical Society of New Jersey at the meeting of its board of trustees in Atlantic City, May 23. Other officers include Drs. Royal A. Schaaf, Newark, and J. Howard Hornberger, Roebling, vice presidents; Alfred Stahl, Newark, secretary, and George J. Young, Morristown, treasurer. The board, which met in place of the 179th annual convention of the society, scheduled five public meetings throughout the state in defense of what is called "the American way of medicine," according to the New York *Times*. The sessions were to be held in Atlantic City June 11, Camden June 12, Trenton June 13, Paterson June 14 and Newark June 15 and will represent the five judicial districts of the state society.

NEW YORK

Typhoid Carriers.—A total of 480 typhoid carriers were under supervision in upstate New York at the close of 1944, according to *Health News*. Forty-one new carriers were added to and 35 were removed from the register during the year. Twenty-three were discovered as a result of epidemiologic investigation of sporadic cases of typhoid, 4 by means of release cultures, 10 accidentally as a result of routine culturing, and 1 on the basis of information furnished by the

New York City Department of Health. Three previously discovered carriers were added to the register; these carriers had been residing temporarily out of the state. Of the 35 carriers whose names were removed from the register, 23 died; 6 were released from restrictions after the submission of the required number of negative fecal and duodenal specimens following cholecystectomy, while the names of 6 others were removed because of change of residence of the carrier to a community outside the jurisdiction of the department. Noteworthy is the fact that only 97 cases of typhoid were reported to have occurred in the upstate area during 1944. Since the best evidence indicates that an average of 3 per cent of typhoid patients become chronic carriers, it is assumed that not more than 3 chronic carriers will develop from these cases. On the other hand, during the same period 23 carriers died. These data indicate the extent to which the typhoid problem is diminishing in New York State.

New York City

Heart Association Moves.—The New York Heart Association, Inc., is now located in the New York Academy of Medicine, 2 East 103d Street.

New Drug Exhibit.—On October 1 a drug exhibit will be opened at the New York Academy of Medicine which will be unrestricted as to subject and will include a variety of significant and new therapeutic agents. The first drug exhibit of the academy opened Oct. 9, 1944 and will be dismantled some time this month. This exhibit was restricted to items bearing on the treatment of infections. Thirty-eight pharmaceutical organizations participated in the current exhibit.

United Medical Service Extends Service.—At an increased rate of 12 cents a month the United Medical Service, Inc., on May 23 offered its subscribers an additional service covering payment of medical bills in hospitals. Newspapers reported that the new plan, which would provide payment for such hospitalized cases not requiring surgery or obstetric cost such as pneumonia, heart trouble and kidney disease, further broadens the services offered by organized medical societies in the service.

Physician Sentenced for Bandage Diversion.—Dr. Abraham Freitag, Brooklyn, who pleaded guilty May 25 to violation of War Production Board priority regulation through the diverted sale of three million yards of bandage material intended for the armed forces into production of civilian goods, was sentenced May 31 to three years in prison and fined $100,000, newspapers reported (THE JOURNAL, April 14, p. 1002). Francis G. Caffey, federal judge, imposed the sentence, which is said to be the "heaviest black market sentence ever imposed" in the New York area. Dr. Freitag, whose action was characterized by U. S. Attorney John F. X. McGohey as "one of the meanest frauds ever perpetrated in this district," was given until June 18 to surrender.

NORTH CAROLINA

New Hospital Control Board and Advisory Commission.—Governor Cherry has appointed fifteen members of the new North Carolina Hospitals Board of Control authorized by the last general assembly. The board is composed of one member from each of the state's twelve congressional districts and three members at large. Among physician members of the board are Drs. Yates S. Palmer, Valdese, representing the tenth district, and Thomas V. Goode, Statesville, ninth district. The governor also appointed a twelve man advisory commission to assist the hospital board of control and named Dr. Hubert B. Haywood, Raleigh, chairman. Other members of the commission include:

Dr. Coy C. Carpenter, Winston-Salem, dean of the Bowman Gray School of Medicine of Wake Forest College.
Dr. Wilburt O. Davison, Durham, dean of the Duke University School of Medicine.
Dr. Walter R. Berryhill, Chapel Hill, dean of the University of North Carolina School of Medicine.
Dr. Maurice H. Greenhill, Durham, in the psychiatric department of Duke Hospital.
Dr. George T. Harrell Jr., Winston-Salem, professor of internal medicine of the Bowman Gray Medical School.
Dr. Lois B. F. Stanford, Durham, on the staff of Watts Hospital, only woman member of the committee and former member of the state hospital board of control.
Charles C. Poindexter, Greensboro, past president of the North Carolina Dental Society and former member of the hospitals board of control.
Dr. James W. Vernon, Morgantown, superintendent, Broadoaks Sanatorium.
Dr. Charles F. Strosnider, Goldsboro, in the field of internal medicine, with considerable experience in the work of the Negro hospital at Goldsboro.
Dr. Paul F. Whitaker, Kinston, president of the North Carolina Medical Association.
Dr. Carl V. Reynolds, Raleigh, secretary of the state board of health.

OHIO

Birthdays of Physicians.—Dr. John H. Norris, Fostoria, observed his ninetieth birthday May 13. Dr. Norris first located in Bowling Green in 1877, moving to Fostoria in 1889, where he has been practicing since that time.——Dr. Auguste Rhu, Marion, celebrated his ninety-sixth birthday April 5. According to the state medical journal, Dr. Rhu is believed to be the oldest practicing physician in the state.

Edward Malone Retires.—Dr. Edward Fall Malone, professor of anatomy at the University of Cincinnati College of Medicine, Cincinnati, will retire, effective July 1. Dr. Malone is retiring at his own request because of ill health. He joined the staff of the University of Cincinnati in 1910 as assistant professor of anatomy; in 1918 he was made professor of histology and in 1925 Francis Brunning professor of anatomy and director of the department. His successor has not been announced.

Tuberculosis Control Program.—For the first time in the history of the state, a widespread tuberculosis control program has been inaugurated by the state department of health involving patients and employees in all state welfare department institutions. Nearly 40,000 patients and employees will soon undergo chest x-ray examinations as part of the control program, according to the state medical journal. A mobile unit, including a physician and a technician, will be lent by the United States Public Health Service for the survey.

Ohio Medical Indemnity.—The Ohio State Medical Association on May 23 filed papers of incorporation for the Ohio Medical Indemnity Inc. The insurance company, which will be controlled by the state medical association and operated on a statewide basis, will provide indemnity for obstetric and surgical expenses and will be available to participants to Blue Cross hospital plans in the state. According to the Cleveland *Plain Dealer* the company will start business with $100,000 capital assets and a cash surplus of at least $30,000, funds to be raised through the sale of stock to Ohio physicians and others interested in the plan. The benefits at the start will range from $10 to $150, depending on the disability and payable to the policyholder. The *Plain Dealer* stated that the Ohio State Medical Association invited the Cleveland Hospital Service Association to cooperate with the physicians in their insurance plan but this organization decided to go ahead with plans for its own indemnity insurance company, which was launched May 22 under the name Medical Mutual of Cleveland, Inc., and which also provides benefits in case of surgical and obstetric expenses.

RHODE ISLAND

Society News.—The Providence Medical Association was addressed May 7 by Drs. Roland Hammond, Providence, on "Hugh Owen Thomas: The Apostle of Rest" and Orville T. Bailey, Boston, on "The Uses of Purified Human Fibrinogen and Thrombin in Medicine and Surgery."

Meeting on Industrial Health.—The New England Conference of the American Association of Industrial Physicians and Surgeons was held at Pawtucket, May 2. Included among the speakers were:

Dr. John E. Donley, Providence, Rehabilitation of Workers Under the Workmen's Compensation Act at the New Curative Center.
Dr. Ubaldo E. Zambarano, Wallum Lake, Tuberculosis in Industry.
Dr. Vincent J. Ryan, Providence, Industrial Dermatoses—Treatment.
Dr. Henry B. Moor, Providence, Burns and Treatment.

SOUTH CAROLINA

Personal.—Dr. Luther A. Riser has resigned as director of the department of vital statistics of the state board of health, Columbia.

"Industrialights."—The South Carolina State Board of Health and the division of industrial hygiene are cooperating in the publication of a health news abstract entitled *Industrialights*, which was to appear for the first time in May.

Dr. Williams Honored.—A special program was held May 1 honoring Dr. Charles F. Williams on his retirement as medical superintendent of the South Carolina State Hospital, Columbia, to become director of the hospital's research activities (THE JOURNAL, March 24, p. 725). A feature of the occasion was the announcement of a portrait of Dr. Williams to be painted by Charles Mason Crowson. Dr. Williams held the superintendency for thirty years. Dr. Coyt Ham, clinical director at the hospital, is the new superintendent, and Dr. Glenn B. Carrigan will succeed Dr. Hoyt in his position.

Statewide Tuberculosis Program.—The industrial committee of the South Carolina Tuberculosis Association plans to photofluorograph all industrial employees in the state. Results will be checked and cooperation will be extended to place employees in sheltered work as well as to assist private physicians in the isolation of infectious cases of tuberculosis. The program was adopted from an x-ray survey carried on by the state board of health. The program will work through the county health departments and tuberculosis associations and with the full assistance of the consultant nurses of the industrial hygiene division.

TENNESSEE

Physician Expands Telephone Service.—Dr. Leander C. Bryan, who owns the Rutledge Telephone Company of Rutledge, has received permission by the state railroad and public utilities commission to enlarge his telephone exchange and install dial telephones. The physician entered the telephone business for the convenience of his patients, newspapers reported, and is said to have taken over the exchange because improved service was necessary for his practice. His company's 230 miles of line serves 192 subscribers.

Fifty Year Practitioners Honored.—Dr. William L. Howard, Memphis, who has completed fifty years in the practice of medicine, observed the event by giving a dinner recently for his colleagues who have practiced the same length of time. Guests at the dinner included Drs. Eugene M. Holder, Benjamin F. Turner, Elmer E. Francis, William B. Burns, Alfred Moore and Arthur B. Williams. Two physicians who could not attend because they were out of town were Drs. Edward C. Ellett and Pope M. Farrington. All are of Memphis.

VIRGINIA

Special Meeting to Discuss Health Education.—The health education program now being promoted in a limited number of counties on an experimental basis under the direction of the health and physical education section of the division of instruction, state department of education, was the reason for a special meeting of the council of the Medical Society of Virginia in Richmond, April 6. The state medical journal reported that the program as first presented was all right but that it had not been carried out according to plan and, further, it had been found that it was started before being presented to the council or state health department. It had been stated that the medical and hospital services would be financed by civic and community organizations, but it was learned that the parents were being required to pay if they were thought to be financially able. One physician at the meeting contended that if a fee is paid by the parent the patient is a private one and should be allowed the selection of his physician. It was pointed out at the meeting that the Lynchburg physicians had done no operations nor would they under the present plan and that hospitals had stated that they would be unable to accommodate for hospital care these children under the program. One recommendation urged that an announcement be published pointing out that the worker carrying on the educational program was a Ph.D. and not an M.D. and stating that the defects found in school children were the result of an examination made by teachers and that therefore many of these defects probably would not be found to be present if examined by competent physicians. The meeting resulted in the agreement of the council to appoint a committee to meet with Mr. Eliot V. Graves, supervisor of physical and health education for the state, to develop a standard and cooperative program. A resolution previously adopted by the council was reaffirmed, approving the principle of health education in state schools but disapproving other aspects of the project as carried out in the experimental counties. The resolution further approved the examination of school children by competent physicians and the correction of remediable defects. The opinion of the council that the project should be supervised by the state health department was carried.

WASHINGTON

Hospital Beneficiary on Insurance Policies.—The Children's Orthopedic Hospital, Seattle, recently received $156,465 from the Seattle Life Underwriters Association from insurance policies that have been written as a part of a campaign started in 1925 to provide the hospital with an adequate endowment fund. Eventually the hospital is to realize $366,232, which would have been $32,492 more had not the hospital been required to pay this amount to keep in force policies of some persons who could not continue to pay premiums. The Children's Orthopedic Hospital was founded as a 7 bed ward in the Seattle General Hospital in 1907 by 24 women who pledged $20 each to help the city's crippled children. In 1925 the insurance idea was launched and the recent sum of $156,465 was the result of endowments maturing in 1945. A total of $789,771 of insurance was written during a two week campaign. More than half of the amount, principally in $500 and $1,000 policies, was kept in force despite the depression, an unusual retention record for bequest insurance, an announcement stated. The proceeds of the policies go into the institution's permanent fund and cannot be expended for maintenance or building needs.

GENERAL

International Health Organization.—A security conference committee in San Francisco on May 28 voted unanimously to support a China-Brazil proposal for an early world conference to form an international health organization, newspapers report.

Papaverine Removed from Quota Restrictions.—H. J. Anslinger, commissioner of narcotics, Bureau of Narcotics, Treasury Department, Washington, D. C., announces that the increased production of papaverine has so improved the supply situation pertaining to this drug that it can now be removed from quota restrictions. Manufacturers and wholesalers may now purchase whatever quantities of the drug are required by them for manufacture or distribution for medical needs, irrespective of any quota limitation heretofore imposed.

First Scholarship Awarded in Physical Therapy.—The first scholarship award in the campaign of the National Foundation for Infantile Paralysis to recruit 1,000 persons for physical therapists was made to Miss Marjorie Katherine Ionta, North Weymouth, Mass., during a luncheon meeting at the Waldorf-Astoria, New York, May 25. Miss Ionta will study at Harvard Medical School, Boston. This activity will be financed by $1,267,600 earmarked for physical therapy by the National Foundation (THE JOURNAL, March 24, p. 727).

Architects Urge Accessibility of Buildings for Cripples.—A seven point program to make public buildings easily accessible to handicapped persons, both veterans and civilians, has been proposed by the architects' advisory committee of the National Society for Crippled Children, newspapers report. The plan would eliminate outside steps to public buildings and flights of steps by providing grade level entrances. It would provide convenient elevator service in all buildings, eliminate inside steps, do away with all excessively high curbs and place hand rails on both sides of steps the full length of flights wherever steps cannot be eliminated.

Abbott Laboratories Provides Research Fellowships.—The Abbott Laboratories, North Chicago, Ill., has appropriated $50,000 to provide for research fellowships in ten universities. Under the terms of the grants, $5,000 has been given each university to support research in the field of medicinal products during a five year period beginning a year after cessation of hostilities. The universities are to have the sole right to publish, patent, license or otherwise dispose of the results of the research conducted. The grants do not restrict the universities regarding the type or scope of the problem selected within the specified field of research. The ten universities and the fellowships to be established in them are California Institute of Technology, Pasadena, Calif., research in physical chemistry and biophysics; Cornell University, Ithaca, N. Y., research in bacteriology; Harvard University, Cambridge, Mass., research in pharmacology; University of Illinois College of Medicine, Chicago, research in pharmacology; Massachusetts Institute of Technology, Cambridge, research in organic chemistry; University of Minnesota, Minneapolis, research in biochemistry; Ohio State University, Columbus, research in organic chemistry; Purdue University, Lafayette, Ind., research in organic chemistry; Tulane University of Louisiana, New Orleans, research in chemotherapy and tropical diseases, and the University of Wisconsin, Madison, research in nutritional chemistry.

CORRECTION

Rats and Rat Bites.—The Current Comment with this title published in THE JOURNAL, June 2, page 367, contains the statement that "almost 25 per cent of the people in a 2 square mile area of Baltimore were bitten by rats over a four year period!" This should have read "Almost 25 people per year in a 2 square mile area of Baltimore were bitten by rats over a four year period!"

Foreign Letters

LONDON

(From Our Regular Correspondent)

May 12, 1945.

The Shortage of Medical Books and Journals

As with all other forms of publication, the medical is in great difficulties as a result of the paper control imposed by the war. In the House of Lords Viscount Buckmaster raised the question of the supply of paper for medical publications. He said that publishers were now unable to supply the basic minimum of books needed by medical students. "Gray's Anatomy" was quite unobtainable. He had tried to get it, either new or second hand, without success. The same applied to "Buchanan's Anatomy" and "Cunningham's Anatomy." In physiology matters, if anything, were worse. In one class of students 15 per cent could not beg, borrow or by any means short of theft obtain a copy of any of the leading works. The physician in practice was in the same trouble. Not merely were writers prevented by shortage of paper from writing books, but there was a shortage of journals. An editor had advised him that he had a waiting list of 1,500 doctors seeking to become subscribers and that he was quite unable to meet the demand for his journal in the liberated countries. Another editor assured him that he could not meet the demands of his subscribers, that his correspondence was drastically cut down and that much medical knowledge of the first importance could not be passed on. The new field of social medicine required every encouragement, but the Ministry of Supply refused to allow the British Medical Association a ton of paper a year to start a *Journal of Social Medicine*.

Replying for the government, the earl of Selborne, minister of economic warfare, said that the government was aware of the immense importance of books, especially at the present time. But although we had more ships than ever before, shipping shortage was greater than ever owing to other demands. We had acquired all the paper we could in America and an addition was not possible. Moreover, every ton of shipping was now required for pursuing the war and for feeding liberated Europe. Paper was not the only bottle neck; labor in the printing and publishing trades was also in short supply. As to medical books, he was advised that their publication at the moment was 80 per cent of that before control. But this was a matter requiring the most serious consideration and he would draw the attention of the president of the board of trade to the remarks made.

The Presidency of the British Medical Association

The British Medical Association has had the misfortune of losing two presidents in the past two years who died while in office: Sir Beckwith Whitehouse and Lord Dawson. The council has appointed Mr. H. S. Souttar, surgeon to the London Hospital, as president until the next annual representative meeting in July and has recommended to the representative body his election as president for the coming year. The new president is a leading surgeon in active practice and has held a succession of high offices in the association. In 1934-1937 he was chairman of the representative body. He was chairman of the council during the first four years of the war, of the Central Medical War Committee and of the Medical Planning Commission.

Medical Students for German Concentration Camp

The official report on the conditions in the German concentration camps for political prisoners which have been captured by the Americans have horrified the British public. To help in the treatment of cases of starvation 95 senior medical students from the London hospitals have been sent to Belsen camp under the auspices of the Red Cross. The students volunteered in response to a call from the Ministry of Health. They will operate in teams of 12 under the guidance of experts from the Ministry of Health and Ministry of Food and under the direction of the Civil Affairs Branch of the British Armies of Liberation. At Belsen concentration camp six civilian teams are already workering. Five are manned by members of the Red Cross and the sixth is a relief team of the Society of Friends. Each team consists of 12 men and women and is self supporting, carrying its own cooking and washing apparatus and its own stores and equipment. Two ambulances, two trucks and a 3 ton lorry are attached to each team.

PARIS

(From Our Regular Correspondent)

April 24, 1945.

Health Conditions in France

The minister of public health, who is the guardian of the health of the nation, has given to the consultative assembly serious evidences on the health conditions in the country. The figures and comments concern not only the physical status of the population, with impressive demographic statistics, but also the moral status created by the years of war and suffering. For instance, 37,000 children have been abandoned, compared to 20,000 in 1936; the number of delinquent children has advanced during the same period from 12,000 to 36,000; the assistance organizations at present have in their charge more than 200,000 minors but are far from having sufficient resources and equipment necessary to accomplish this hard task.

Infant mortality has increased 40 per cent; cases of typhoid have doubled, those of diphtheria have tripled; cases of tuberculosis have increased by about 11 per cent on the average, but in Paris by 48 per cent and at the mouth of the Rhone (Marseilles) by 74 per cent.

In 1943 there were 64,000 deaths from tuberculosis, a figure certainly lower than it is in reality, particularly since the deaths are often declared under other causes than tuberculosis. For the ages between 20 and 40 years, more than 40 per cent of the deaths are due to tuberculosis and for the women of this age, which is that of maternity, it is 49 per cent. This is different from cancer, which kills 10 per cent of women but mostly those over 40. This shows what influence the tuberculosis mortality can have on the birth rate. According to Moine, statistician of the Comité national of the campaign against tuberculosis, this disease has killed 4 million in France since 1900, of which number 1½ million would have been alive today, a figure which would add to the population yet another million of the children they would have had. If France had only had the tuberculosis mortality of Great Britain, its population today would be 600,000 more. The tuberculosis mortality in France remains at 137 per hundred thousand inhabitants in contrast with 48 in the Netherlands, 54 in the United States and 71 in Great Britain. It has decreased in all countries by 66 since the beginning of the century: 66 per cent in the United States, in the Netherlands and Germany, 55 per cent in Great Britain and only 39 and 38 in Italy and France.

Three different periods during the war can be differentiated: from September 1939 to the winter of 1940; 1941 and 1942, and 1943 and 1944. The first period which followed the declaration of war presents nothing unusual, but beginning with the summer of 1940 one observed a noteworthy increase in the cases registered by the insurance organizations. The seriousness of 20 per cent of these cases became alarming. The miliary and meningitic forms multipled; the rapidly fatal developments advanced from 15 per cent in 1937 to 45 per cent. The fatal extrapulmonary localizations, bilateralization and relapses were seen more frequently. During the third period the serious forms became less frequent and the mortality decreased. It seems that there had been a sort of epi-

demic of serious tuberculosis; all those who did not have sufficient resistance having been decimated, the surving ones were less vulnerable. But it is now already certain that the mortality figures of tuberculosis in France for the years to come will be above all those recorded up to now.

Criminal Abortion

According to Dérobert of the Société de médecine légale de France, in 1938 it was estimated that 500,000 criminal abortions were practiced in France; that is to say, a figure much greater than that of living births. Dérobert affirms that this figure of 500,000 is greatly exceeded at present. Meanwhile the legislator has not ceased to increase legal action against this national scourge, either by repressive measures or by arrangements such as the pardon for informers, the dispensation from professional secrecy, the supervision of maternity homes and so on. However, the evolution of repression is "a series of capitulations."

Sociologists as well as physicians have hoped to conquer the scourge by repression rather than by prevention. Criminal abortion depends on two types of factors, moral and pecuniary. The one or the other predominates, depending on the environment. In former times the moral factor was principally the dishonor of being an unmarried mother; at present it consists above all in the selfishness and the amorality of the prospective mother and her surroundings. This degradation in individual and social morality goes parallel with the weakening of religious morality, which lives or sleeps in every soul.

However, it is necessary to consider the pecuniary factors. The child who is born in France in our days is a heavy burden and a considerable encumbrance. The first born is accepted, but the others are undesirable. Statistics set up by social insurances show that 66 per cent of women who abort have only one child. France is the country of the family with one child. The second one costs too dear and creates too many difficulties in a country where everything is missing.

Certainly there are fiscal privileges and special allocations for large families, but they hardly count for one or two children; they increase only slightly for a family of three children; they are far from compensating for the increase in expenses which the children cause.

Food Rationing in France After the War

Based on the general forms of human food allowance fixed by the League of Nations in 1936 and 1938, Simonnet of the Institut national d'hygiène has tried to establish the food ration suitable for the French after the war. He has adapted theoretical information to the various realities: resources of the nation, former habits, climatic conditions and nutritional needs created by the state of malnutrition resulting from the war. He has also taken account of the correlations between nutrition and the morbidity in various diseases and the needs of certain groups of the population.

The work of Simonnet consists of four parts: (1) the determination of energy producing foods, (2) the determination of the protein requirements, (3) the determination of the mineral and vitamin requirements and their transposition in protective foods and finally (4) the estimation of fat and carbohydrate requirements.

He arrives at two conclusions: 1. The per capita consumption without taking into account the age, the occupation and the pathologic or physiologic status. 2. The establishment of a scale of coefficients applicable to every category of the total population.

The energy producing needs correspond to the sum of several elements: the caloric needs of the basal metabolism, the specific dynamic action of the foods, the thermoregulation, the muscular and digestive work, growth and, in pregnant women or young mothers, the requirements of gestation and lactation. On the other hand, the environment in which the person lives, his present state of nutrition, his age, sex and muscular activity may modify the average figures. The specific dynamic action varies according to the nature of the foods ingested and according to their combination. The thermoregulation is influenced by the work, the clothing and the external temperature. Muscular work varies greatly, as do also the requirements of growth. A careful study arrives at a figure between 2,400 and 2,750 calories for twenty-four hours for a person weighing about 143 pounds (65 Kg.).

Reliable statistics indicate for the usual consumption of a person in France before the war an average of 3,000 calories. The soldier, for instance, receives a ration of from 2,926 to 3,434 calories. In a large insane asylum the ration was 2,800 calories. Richet has evaluated the intake of a Parisian before the war at 3,278 calories. In 1943 the allowance was only from 1,500 to 1,800 calories according to the categories of consumers; the Germans had decided that the French ate too much. Moreover, it should not be forgotten that the French food allowance was terribly unbalanced, which complicates the study of its effect on the disturbances of malnutrition observed since 1939.

The fats should account in the diet of tomorrow for about 46 Gm. and the carbohydrates for 400 to 450 Gm.

The theoretical ration of the French will be established at around 2,800 calories, provided by 100 Gm. of proteins, of vegetable and animal origin in equal parts, 420 Gm. of carbohydrates and 60 to 80 Gm. of fats.

Pressure in the Right Ventricle

Lenègre and Maurice communicated to the Société de cardiologie their first investigations on the pressure in the right ventricle. They introduce through an arm vein and into the right ventricle a semisoft catheter of small caliber that is connected with a Claude manometer. The pressure observed in normal subjects was between 10 and 20 cm.; it is slightly higher in adults than in young subjects. In 37 patients with cardiac disorders figures as high as 60 were reached; the mean was 31. Thus between healthy subjects and those with heart disease differences of as much as 1 to 5 may exist; that is to say, the differences are much greater than those encountered in the systemic circulation. The ventricular pressure attains its maximum in grave mitral valvulitis with cardiac insufficiency or pulmonary complications. It was also ascertained that the intraventricular pressure is higher in the reclining than in the upright posture; this may explain the dyspneas of the reclining position, which are so distressing in the course of ventricular syncopes.

Marriages

JUDSON ALBERT MILLSPAUGH, Lieutenant Commander (MC), U. S. Navy, to Miss Ellen Ann Huskes in Hollywood-in-Florida, April 9.

GUY PARRY YOUMANS, Chicago, to Miss Anne Louise Stewart of Springfield, Mo., in Winnetka, Ill., March 17.

JACK M. STEMPER to Miss Dorothy Mae Campbell, both of Kansas City, Mo., in Kansas City, Kan., March 10.

WILLIAM CHARLES RUCKER to DR. VENDELA EVELYN OLSON, both of Hackensack, N. J., April 28.

SIEGFRIED R. BERTHELSDORF, Olene, Ore., to Miss Mildred Freiderich of Tampa, Fla., May 13.

ROBERT LANCEFIELD THOMAS, to Miss Gladys Margery Watt, both of Berkeley, Calif., April 28.

MICHAEL V. GUALTIERI to Miss Shirley Margaret Lawson, both of Waterbury, Conn, May 5.

WILLIAM LE GRAND HOON, Prospect, Pa., to Miss Anna M. Tyrrell of Merion, Pa., March 29.

ALBERT GAYLAND YOUNG, Boston, to Miss Mary A. Kennedy of Rochdale, Mass., April 7.

Deaths

Oliver James Fay ✠ died at the Iowa Methodist Hospital, Des Moines, June 2, of arteriosclerosis and myocardial failure, aged 70.

Dr. Fay was born in Pottsville, Iowa, July 2, 1874. He received his B.S. degree at the Iowa State College in 1898 and graduated at the College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, in 1902, serving his internship at Augustana Hospital, Chicago. In 1904 he returned to Des Moines to specialize in surgery. Subsequently he became a charter member of the American College of Surgeons and a founder member of the American Board of Surgery. He had served as president of the Polk County Medical Society and of the Iowa State Medical Society, holding membership on the latter's board of trustees since 1924. He had also been president of the Northwest Conference for Medical Service. Included among the groups in which he also held membership are the Western Surgical Association, the American Association of Railway Surgeons and the American Association of Industrial Physicians and Surgeons. He was a member of the staff of the Iowa Methodist Hospital and a consultant to the Broadlawns General Hospital, chief district surgeon for the Rock Island Railroad, consultant surgeon for the Burlington and Northwestern railroads and retired medical director of the Northwestern Bell Telephone Company.

Dr. Fay had been medical director of the Iowa State Industrial Commission since its inception in 1913; in 1933 he was one of nine members of a committee specially appointed by the legislature to investigate the causes and suggest remedies for the waiting list of indigent patients committed but not admitted to the University Hospitals, Iowa City.

One of Dr. Fay's chief interests was the acquisition of a medical as well as a comprehensive general library. In 1940 he donated his own private collection of some 1,500 volumes to found the medical library at the Iowa Methodist Hospital.

Max Winsor ✠ New York; Columbia University College of Physicians and Surgeons, New York, 1932; member of the American Orthopsychiatric Association; educational director of the Amalgamated Clothing Workers Union from 1922 to 1924, and from 1926 to 1931 engaged in the study of penal institutions in the United States and psychologic studies of one hundred leading criminals for the Rockefeller Foundation; from 1932 to 1937 initiated liaison between the Neurological and Psychiatric Institute of the Columbia Presbyterian Medical Center and the New York State Training School for Boys to provide medical and psychiatric treatment for delinquent boys; administered this program at the New York Training School for Boys at Warwick, N. Y., where he was a resident in the medical center unit; in 1937 established the first clinic for psychiatric treatment in the Children's Court in New York City; in 1938 appointed to the bureau of child guidance of the city board of education as psychiatrist in charge of the Harlem area; beginning in 1940 the New York School of Social Work of Columbia University established a teaching unit under his direction for psychiatric social work majors; in September 1943 named director of clinical work in a two year research project sponsored by the New York Foundation and the board of education; in the summer of 1944 appointed to the staff of the New York School of Social work as lecturer in social psychiatry; vice chairman of the citywide citizens' committee for Harlem and served as chairman of its subcommittee on delinquency; a member of the board of Wiltwyck School and of the advisory committee of the Treatment Clinic of the Domestic Relations Court; died in the Beth Israel Hospital May 4, aged 47, of coronary heart disease.

Maurice Holmes Rees ✠ Denver; Washington University School of Medicine, St. Louis, 1921; since 1925 dean and since 1921 professor of physiology and pharmacology at the University of Colorado School of Medicine, where during 1924-1925 he served as assistant dean; fellow in zoology at the University of Illinois, 1904-1905; professor of science at the York (Neb.) College, 1905-1906; professor of biology at the Tarkio (Mo.) College from 1906 to 1914; assistant professor of physiology at the University of Kansas from 1914 to 1916; associate in physiology at the University of Chicago, 1916-1917; professor of physiology at the University of South Dakota from 1917 to 1921; chairman of the Section on Pathology and Physiology of the American Medical Association, 1928-1929; member and formerly chairman of the executive council of the Association of American Medical Colleges, of which he had been president and vice president; had been active in that organization for several years; elected vice president of the Advisory Council on Medical Education at its formation in 1939; past president of the Denver Public Health Council; fellow of the American College of Hospital Administrators; in 1941 elected to membership in the National Board of Medical Examiners, serving as chairman of the subsidiary board of Denver; member of the American Physiological Society and the Denver Clinical and Pathological Society; in 1932 chairman of the medical service division of the Colorado White House Conference on Child Health and Protection in Denver; superintendent of the Colorado General Hospital; died May 25, aged 62, of coronary occlusion.

William Anthony Mulherin ✠ Augusta, Ga.; Harvard Medical School, Boston, 1901; emeritus professor of clinical pediatrics at the University of Georgia School of Medicine; member of the House of Delegates of the American Medical Association in 1942, 1943 and 1944, and vice chairman of the Section on Diseases of Children in 1921, serving as chairman of the section in 1928-1929; in 1922 appointed a member of the Abraham Jacobi Committee of the section and later a member of a committee to study teaching of pediatrics in American universities and report to the section with suggestions as to betterments; fellow of the American Academy of Pediatrics; one of five to organize the pediatric section of the Southern Medical Association, serving as secretary of the section in 1919 and chairman in 1920; member of the American Pediatric Society; past president of the Medical Association of Georgia; served as a member of the state board of health and as chairman of the Richmond County Board of Health; dean emeritus of the Southern Pediatric Seminar, which he organized; organized pediatric societies in various localities; served as a member of President Hoover's Conference on Child Health and Protection; on the staffs of the University and Children's hospitals; received the honorary doctor of science from the University of Georgia in 1929; died in his sleep April 19, aged 72, of coronary thrombosis.

Joseph Byrne, New York; College of Physicians and Surgeons, New York, 1895; formerly dean and professor of neurology at the Fordham University School of Medicine; veteran of the Spanish-American War; past president of the medical board of the Central and Neurological Hospital on Welfare Island; had long been a consultant to the City, Fordham and Neurological hospitals; served as a member of the advisory board of the city health department; fellow of the New York Academy of Medicine; member of the Royal College of Surgeons of England, Society for Experimental Biology and Medicine, New York Neurological Association and the Alumni Association of the College of Physicians and Surgeons; received the bachelor of laws degree from the New York Law School in 1900 and the degree doctor of laws from the Fordham University in 1921; author of numerous books; had made extensive experimental and clinical studies on the mechanism of sensation and contributed numerous articles to the literature; died May 13, aged 75, of cardiac asthma.

Howard Elmer Ashbury ✠ Baltimore; University of Maryland School of Medicine, Baltimore, 1903; also a pharmacist; specialist certified by the American Board of Radiology, Inc.; member of the American Roentgen Ray Society and the American College of Radiology; for many years assistant in surgery and orthopedic surgery at the Johns Hopkins University School of Medicine and Hospital; during World War I a major in the medical corps of the U. S. Army, serving as professor of roentgenology at the Army Medical School, as inspector of the roentgenologic service of the Eastern department and as chief of the x-ray laboratory of the U. S. Army; relieved from active duty as a lieutenant colonel in the medical corps of the Army of the United States in February 1944; consultant roentgenologist for the U. S. Veterans Bureau; roentgenologist at St. Joseph and Provident hospitals; consultant on the staff of the Waynesboro (Pa.) Hospital; died February 20, aged 64.

Hiram N. Vineberg ✠ New York; McGill University Faculty of Medicine, Montreal, Que., Canada, 1878; in 1918 president of the New York Obstetrical Society and in 1926 a vice president of the American Gynecological Society; fellow of the American College of Surgeons; in 1894 appointed chief of staff in the outpatient department of Mount Sinai Hospital, where he had been ever since, having been appointed consulting gynecologist on his retirement in 1921; in June 1943 was presented by his colleagues with a special volume of scientific writings to mark his completion of sixty-five years in the practice of medicine; the gift consisted of a three hundred and sixty page issue of the *Journal of the Mount Sinai Hospital*; associated at various periods with the Polyclinic, St. Mark's and Post-Graduate hospitals and the Montefiore Home for Chronic Invalids; for many years gynecologist in chief at Beth Moses Hospital; died May 4, aged 87.

George Mason Creevey ✠ New Hartford, Conn.; Columbia University College of Physicians and Surgeons, New York, 1896; an Affiliate Fellow of the American Medical Association; member of the Medical Society of the State of New York, American Society of Anesthetists, International Anesthesia Research Society and the International College of Anesthesia; specialist certified by the American Board of Anesthesiology, Inc.; formerly chairman of the anesthesia committee of the Doctors Hospital, consulting anesthetist, Flower-Fifth Avenue Hospitals, New York Eye and Ear Infirmary and New York Orthopedic Dispensary and Hospital all in New York; died April 30, aged 72, of coronary occlusion.

Charles Eugene Ferguson, Indianapolis; Medical College of Indiana, Indianapolis, 1892; professor emeritus of obstetrics at the Indiana University School of Medicine; at one time secretary of the city board of health; past president of the Indianapolis Medical Society and the Indianapolis Literary Society; fellow of the American College of Surgeons; member of the consulting staff and formerly superintendent of the Indianapolis City Hospital; served as superintendent of the City Dispensary; consultant, Robert W. Long Hospital; formerly on the staffs of the City Hospital, St. Vincent's Hospital and the Methodist Hospital, where he died May 18, aged 88, of cerebral hemorrhage.

Louis Joseph Burns, Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1900; associate professor of laryngology at the Medico-Chirurgical College, Graduate School of Medicine, University of Pennsylvania; member of the American Medical Association, the American Academy of Ophthalmology and Otolaryngology and the American Laryngological, Rhinological and Otological Society; life member of the Philadelphia Laryngological Society; specialist certified by the American Board of Otolaryngology; on the staff of the Philadelphia General Hospital; died May 20, aged 70.

Thomas Ambrose Bray, Holliston, Mass.; Georgetown University School of Medicine, Washington, D. C., 1922; member of the American Medical Association; interned at the Central Dispensary and Emergency Hospital in Washington, D. C., and St. Francis Hospital in New York; served a residency at the New York Eye and Ear Infirmary in New York; formerly on the staff of St. Vincent Hospital in Worcester; on the staffs of the Framingham (Mass.) Union and Milford (Mass.) hospitals; died April 1, aged 50, of acute myocardial failure.

Robert Swan Alston ✠ Philadelphia; University of Pennsylvania School of Medicine, Philadelphia, 1917; fellow of the American College of Surgeons; served during World War I; surgeon at the Stetson Hospital; chief of service in general surgery at the Germantown Hospital, where he died April 24, aged 52, of coronary thrombosis.

Edmund Kent Ayling ✠ South Bend, Ind.; Northwestern University Medical School, Chicago, 1903; died in St. Joseph Hospital April 25, aged 74, of pneumonia.

George Henry Benton, Coconut Grove, Fla.; Metropolitan Medical College, Chicago, 1899; died in a hospital at Miami March 24, aged 77, of cerebral hemorrhage, hypertension and coronary artery disease.

James Henry Boulware, Zanesville, Ohio; Leonard Medical College, Raleigh, N. C., 1911; member of the American Medical Association; city prison physician; on the staffs of Bethesda Hospital and the Good Samaritan Hospital, where he died April 30, aged 63, of coronary occlusion.

Albert William Bouseman, Fountain Green, Ill.; Barnes Medical College, St. Louis, 1910; found dead about 3 miles southwest of La Harpe April 15, aged 64, of heart disease.

Gilbert Freck Bretz, Pottsville, Pa.; Jefferson Medical College of Philadelphia, 1914; member of the American Medical Association; treasurer of the Schuylkill County Medical Society; on the staff of the Lemos B. Warne Hospital, where he died April 14, aged 70, of occlusion of cerebral blood vessels and generalized arteriosclerosis.

Matthew Gardner Buckner ✠ Nashville, Tenn.; University of Nashville Medical Department, 1896; served during World War I; for many years president of the Y. M. C. A.; died April 10, aged 74, of acute nephritis.

James Pettigrew Bunn ✠ Rocky Mount, N. C.; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1935; secretary treasurer of the Edgecombe-Nash Counties Medical Society; past president of the Lions Club; on the staff of the Park View Hospital; part owner of the Speight-Stone-Bunn Clinic Hospital, where he died April 5, aged 35.

C. Dana Carter ✠ Thermopolis, Wyo.; Missouri Medical College, St. Louis, 1895; county health officer and city physician; physician and surgeon for the Chicago, Burlington and Quincy Railroad; county welfare physician; examiner for the Selective Service; for many years owner of the Carter Hospital; died March 20, aged 71, of cardiac failure.

Franklin Harvick Carter ✠ San Diego, Calif.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1911; died April 13, aged 57, of tuberculosis.

Raymond Carlton Clapp Sr., Wichita, Kan.; University of Louisville Medical Department, Louisville, Ky., 1907; died April 20, aged 64.

Charles Ely Coleman, Belleville, Ill.; Bennett Medical College, Chicago, 1914; died April 8, aged 73.

John R. Colson, Schell City, Mo.; University Medical College of Kansas City, 1890; member of the American Medical Association; died in the Nevada Hospital, Nevada, April 14, aged 80, of pernicious anemia.

Artice Edward Culberson ✠ Anniston, Ala.; Birmingham Medical College, 1915; health officer of Calhoun County and city physician; served in France during World War I and as team physician for the athletic organizations at the Anniston High School; on the staff of the Anniston Memorial Hospital, where he died May 1, aged 52, of carcinoma of the stomach.

Edward Thomas Curran, Brooklyn; Long Island College Hospital, Brooklyn, 1905; also a lawyer; veteran of the Spanish-American War and of the Boxer and Philippine rebellions; died March 28, aged 73.

Gilbert Alexander Daniel ✠ Belle, W. Va.; Medical College of Virginia, Richmond, 1926; died April 20, aged 42.

John McCamie De Armon, Charlotte, N. C.; University of Maryland School of Medicine, Baltimore, 1886; member of the American Medical Association; honorary member of the Medical Society of the State of North Carolina; past president of the Mecklenburg County Medical Society; died in the Mercy Hospital April 22, aged 87, of acute dilatation of the heart.

Charles E. Dorr, Worden, Ill.; Marion-Sims Beaumont Medical College, St. Louis, 1903; member of the American Medical Association; on the staff of the St. Francis Hospital at Litchfield; died April 20, aged 64, of angina pectoris.

William Lincoln Downing, Moulton, Iowa; Rush Medical College, Chicago, 1886; member of the American Medical Association; died April 16, aged 83.

Albert C. Earnest, Wheeling, W. Va.; Hospital College of Medicine, Louisville, Ky., 1896; member of the American Medical Association; retired medical examiner for the Baltimore and Ohio Railroad; died April 29, aged 73, of pulmonary tuberculosis.

Logan Felts, Russellville, Ky.; Kentucky University Medical Department, Louisville, 1905; member of the American Medical Association; served overseas during World War I; died April 18, aged 62, of coronary occlusion.

Sidney LaSalle Ford, Hensonville, N. Y.; University of the City of New York Medical Department, New York, 1891; member of the American Medical Association; at one time chairman of the Green County Board of Supervisors; health officer of the towns of Windham and Jewett; died in the Memorial Hospital, Catskill, April 16, aged 80, of coronary thrombosis.

Charles E. Freeman ✠ Colonel, U. S. Army, retired, San Antonio, Texas; Barnes Medical College, St. Louis, 1899; Army Medical School, 1906; entered the U. S. Army as an assistant surgeon in 1906; served during World War I; promoted through the various grades to that of colonel in 1932; retired on Aug. 31, 1937 by operation of law; died in the Brooke General Hospital, Nov. 19, 1944, aged 71, of coronary heart disease.

Frederick J. Freshley, Evansville, Ind.; University of Louisville Medical Department, Louisville, Ky., 1908; died April 8, aged 60, of pulmonary tuberculosis.

Obe C. Gibson, Tampa, Fla.; Louisville (Ky.) Medical College, 1884; died April 22, aged 81, of cardiac collapse with hypertension.

John Fordyce Gruber ✠ Cadillac, Mich.; Saginaw Valley Medical College, Saginaw, 1902; county coroner; served overseas during World War I; on the staff of the Mercy Hospital; died April 18, aged 63, of carcinoma of the small bowel.

Richard Emerson Herring, Arlington, Tenn.; Memphis Hospital Medical College, 1903; died April 15, aged 70, of sulcus tumor of the lung.

John Thomas Herron, Jackson, Tenn.; Jefferson Medical College of Philadelphia, 1884; honorary member of the Tennessee State Medical Association; member of the American Medical Association and served as a delegate from Tennessee in 1904-1905; died in the Memorial Hospital April 21, aged 85, of senility.

Frederick William Hodgins ✠ Oakland, Calif.; University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1896; died April 6, aged 71, of generalized arteriosclerosis.

Isaac Jones Hoover ✠ Owensboro, Kv.; Hospital College of Medicine, Louisville, 1907; member of the Southeastern Surgical Congress; fellow of the American College of Surgeons; past president of the Daviess County Medical Society; served during World War I; on the staff of the Owensboro-Daviess County Hospital, where he died April 22, aged 63, of cardiovascular disease.

William Thorpe Hopkins ✠ Lynn, Mass.; Boston University School of Medicine, 1890; an Affiliate Fellow of the American Medical Association; fellow of the American College of Surgeons; formerly health commissioner of Lynn; on the staff of the Lynn Hospital; died April 10, aged 76, of arteriosclerotic heart disease.

Roy Howe ✠ Daytona Beach, Fla.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1905; served during World War I; on the staff of the Halifax District Hospital; died in the Veterans Administration Facility, Lake City, May 3, aged 69, of cancer of the gallbladder.

Charles Stowell Hunter, West Sunbury, Pa.; Medical Department of the Western University of Pennsylvania, Pittsburgh, 1904; member of the American Medical Association; on the staff of the Butler County Memorial Hospital, Butler, where he died April 5, aged 69, of coronary occlusion and pulmonary embolism.

Alvin Keller, Bloomington, Ill.; Rush Medical College, Chicago, 1901; died in the Alta Bates Hospital, Berkeley, April 6, of coronary thrombosis.

Capt. Orrin Fluhr Crankshaw
M. C., A. U. S., 1910-1945

Capt. Arthur Robert Gersabeck
M. C., A. U. S., 1906-1944

Albert Charles Lamade ✠ Williamsport, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1901; a captain in the medical corps of the U. S. Army, stationed at Camp Wadsworth, during World War I; died April 13, aged 67, of cerebral hemorrhage.

William Sterling Langfitt ✠ Pittsburgh; Medical Department of the Western University of Pennsylvania, Pittsburgh, 1894; fellow of the American College of Surgeons; with his father founded St. John's General Hospital, where he had been director and for many years chief of the surgical staff; died April 16, aged 72, of cerebral arteriosclerosis.

John Wesley Milam, Nashville, Tenn.; Vanderbilt University School of Medicine, Nashville, 1894; died in the Nashville General Hospital April 9, aged 79, following a prostatectomy.

Floyd Palmer ✠ Glens Falls, N. Y.; University and Bellevue Hospital Medical College, New York, 1899; coroner of Warren County; a captain with the American Expeditionary Forces during World War I; on the staff of the Glens Falls Hospital; died March 27, aged 71.

Laura Margaret Preble, Old Town, Maine; Woman's Medical College of Pennsylvania, Philadelphia, 1908; died in a hospital at Bangor February 24, aged 76.

Edward Augustine Quinlan, Port Chester, N. Y.; Albany (N. Y.) Medical College, 1898; a member of the staff of the Ladies Hospital and its successor, the United Hospital, where he remained an active member of the staff until 1942, when he retired; at one time in charge of the Nurses Training School of the institution; died March 16, aged 69.

James William Sparks ✠ Kansas City, Kan.; Kansas City (Mo.) Hahnemann Medical College, 1907; past president of the Wyandotte County Medical Society; on the staffs of the Providence Hospital and the Bethany Hospital, where he died April 9, aged 67, of hemolytic Staphylococcus aureus blood stream infection.

Charles Edward Terry, Wingdale, N. Y.; University of Maryland School of Medicine, Baltimore, 1903; health officer of Jacksonville, Fla., from 1910 to 1917; served as health officer for Harlem Valley State Hospital, where he died February 18, aged 67, of cerebral arteriosclerosis.

Joseph Paul Traynor ✠ Medical Director, Captain, U.S.N., retired, Biddeford, Maine; Medical School of Maine, Portland, 1901; fellow of the American College of Surgeons and of the American College of Physicians; entered the U. S. Navy on May 15, 1902 and retired on June 10, 1928 for incapacity resulting from an incident of the service; died in Scarboro Sept. 12, 1944, aged 66, of coronary occlusion.

Christian Walhonig, Atlanta, Ga.; College of Physicians and Surgeons, Baltimore, 1902; at one time assistant in clinical laboratory at his alma mater; died April 13, aged 66, of cirrhosis of the liver.

KILLED IN ACTION

Orrin Fluhr Crankshaw, Summit, N. J.; Cornell University Medical College, New York, 1935; member of the American Medical Association; served an internship and residency at the New Haven Hospital in New Haven, Conn., where he had been an instructor in the department of internal medicine at the Yale University School of Medicine; served as attending physician for the Bell Telephone Laboratories at Murray Hill and on the staff of the Overlook Hospital; began active duty as a captain in the medical corps, Army of the United States, on July 15, 1942; went abroad with the Yale Medical Unit in November 1942 and later transferred to the medical corps; participated in the battle of Guadalcanal; after returning to this country was sent to England in February 1944; awarded the Bronze Star and Purple Heart for treating injured soldiers under heavy enemy fire after he himself was wounded; attached to the Sixth Armored Division; killed in action in Germany February 23, aged 34.

Arthur Robert Gersabeck, Ypsilanti, Mich.; University of Michigan Medical School, Ann Arbor, 1938; interned at the West Suburban Hospital in Oak Park, Ill.; member of the American Medical Association and the West Virginia Medical Association; entered the medical corps, Army of the United States, on July 20, 1942 as a first lieutenant; began active duty as a captain on Aug. 21, 1942; killed in the European area Dec. 18, 1944, aged 38.

Correspondence

"THE EXPANDING SCOPE OF PUBLIC HEALTH LABORATORIES"

To the Editor:—In the March issue of the *American Journal of Public Health* there appeared an article entitled "The Expanding Scope of Public Health Laboratories," outlining a plan developed in Montgomery County, N. Y., whereby "an approved county laboratory, supported entirely by state and county funds, provides as a free public service for a population of 70,000 people not only the usual diagnostic and sanitary services but also all the medical tests which in most other communities are the task of hospital and private pathological laboratories. This includes all autopsies, surgical pathology, hematology, serology, blood grouping, urinalysis, chemistry of blood and other body fluids, bacteriology, bacterial and agglutination tests, preparation of bacterial vaccines, gastric analysis, basal metabolism, examination of feces and exudates."

In the article the plan is commended on the basis (1) that the centralization of all types of medical and public health laboratory work in one organization eliminates a good deal of duplication and makes better use of plant, apparatus and personnel and (2) that as a consequence of this it is possible to give a small community adequate laboratory service when the amount of work would not be sufficient to support several different hospital, public health and private laboratories.

As chairman of the Committee on Education and Publicity of the American Society of Clinical Pathologists, I have been instructed to call your attention to a situation which is fraught with a great deal of potential danger to the practice of laboratory medicine in particular and perhaps also to that of independent medical practice in general. As the pathologist of an approved hospital laboratory in this state and hence as one who knows from first hand experience the excellent service rendered by the New York State Department of Health Laboratories under the indefatigable efforts and vision of Dr. Augustus Wadsworth, recently retired, I can attest to the valuable progress this group has made in service both to the community and to organized laboratory medicine in the field of public health for the past twenty-five years. However, it would seem to me that in their enthusiasm to enlarge the usefulness of laboratory service to the community by including free laboratory service not directly concerned with public health, as is the case in the plan adopted by Montgomery County, they run a distinct risk of defeating the very ends they desire to attain by any such approach as is outlined in the article. Such a system if put into practice throughout the state and perhaps also in other states would, in my opinion, seriously jeopardize the healthy and natural development that laboratory medicine is now enjoying. It would first of all limit the freedom of choice of the younger pathologist and would tend to force him into seeking state laboratory appointments as the only means of professional and economic development. It would also place at a serious economic disadvantage those private pathologists who work in proprietary hospitals or have laboratories of their own and who engage in outside practice as do other specialists in medicine. These two things to my mind would be serious deterrents to the entry into the specialty of pathology by younger men who might be so inclined. In respect to the public also it would tend to weaken the value of pathologic services, on the basis that something free is not necessarily valuable. It might be harmful also to organized medicine in that, if such a plan by chance should become acceptable to the public, attempts might be made to offer the services of other medical specialists on the same basis to the community.

I should like to make it clear that it is the wish of the American Society of Clinical Pathologists to see a more widespread distribution of laboratory service to the individual community, a point on which the Health Department of New York State concurs; but we seriously question the wisdom of the present approach in recommending that such service be dispensed as a free one to the public. It would seem to us that, with the admitted agreement on a common objective on the part of both the pathologists and the public health agencies in the state and the country at large, the matter might lend itself to a better solution if it was approached jointly by representatives of both groups, motivated by a sincere desire to give an all inclusive modern laboratory service to communities, on a basis of individual community needs and not as is recommended in the Montgomery County Plan, as an overall free public service.

THEODORE J. CURPHEY, M.D., Hempstead, N. Y.

"CHRONIC TOXICITY OF ERGOT"

To the Editor:—In your editorial of April 21 on "Chronic Toxicity of Ergot" you state that "there has been no thorough investigation of the chronic effects of ergot in laboratory animals." The paper by Fitzhugh, Nelson and Calvery (*J. Pharmacol. & Exper. Therap.* **82**:364 [Dec.] 1944) which you quote at length referred only to my first communication in the *American Journal of Pathology* (**6**:299 [May] 1930). I have published additional observations on experimental chronic ergot poisoning in the *Archives of Internal Medicine* (**47**:548 [April] 1931) and in the *Archives of Surgery* (**25**:1135 [Dec.] 1932). Although my first paper described the morbid anatomy of experimental ergot poisoning in 28 roosters, Fitzhugh and his collaborators quote only my observations on 2 animals: These I submitted at length only because the lesions were most typical. In my experiments I obtained lesions of the vessels, particularly of the comb, that were significant. There was intimal proliferation, frequently associated with thrombosis. In some instances there was canalization of the thrombus. Sclerotic and hyaline degeneration of the vascular walls were common findings. The vascular changes resembled closely those observed in thromboangiitis obliterans. There were also trophic changes in the skin, muscles and fasciae supplied by the affected vessels that resembled lesions observed in scleroderma and dermatomyositis. In some instances gangrene of the comb occurred and in 1 animal an esophageal fistula, the result of necrosis. Fitzhugh and his collaborators were not able to produce any vascular changes in rats as a result of ergot feeding. In my original paper I also reported that I was unable to produce vascular lesions in rats, mice, rabbits and guinea pigs by ergot feeding. Feeding with 5 per cent ergot produced no toxic effect. The animals abstained from eating a 10 per cent mixture of ergot because it was distasteful. Ergotism, however, has been produced in rats. McGrath (*Arch. Int. Med.* **55**:942 [June] 1935) injected ergotamine tartrate in doses of 25 to 100 mg. per kilogram of body weight and obtained vascular lesions similar to those I reported, including thrombophlebitis, which incidentally also occurs in human ergotism. The trophic changes in his rats arose chiefly in the tails, which became gangrenous, with a line of demarcation occurring in from sixteen to twenty days. It is well to compare McGrath's doses of ergotamine tartrate toxic for rats to the doses of 9.5 to 117 mg. per 50 to 100 Kg. weight, which have been found very toxic in human beings. It is obvious that the rats are far more resistant. This may account for our inability to obtain vascular lesions in these animals by feeding. McGrath also investigated the greater susceptibility of males to ergotism, a fact I had stressed in the resemblance of this condition to thromboangiitis obliterans. With the administration of estrogens he was able to prevent gangrene in the females and retard it in the males after the administration of ergotamine tartrate.

In 1935 Sir Thomas Lewis (*Clin. Sc.* **2**:43 [Sept.] 1935) noted necrosis of the combs in fowl which he had injected

with ergotoxin. The necrosis he ascribed to a stasis resulting from the combination of a constriction of the arteries with dilatation of their capillaries. This mechanism for the necrosis I reported in my second publication on ergotism in 1931.

JULIUS KAUNITZ, M.D., New York.

To the Editor:—Apropos the editorial "Chronic Toxicity of Ergot" appearing in THE JOURNAL, April 21, may I suggest that you supplement your comments on the effect in animals by calling attention to a report in the *American Journal of Veterinary Research* for April 1945. The article on page 107, "Ergotism in Pregnant Sows, Female Rats and Guinea Pigs" will be a revelation.

GEORGE F. FASTING, M.D., New Orleans.

DIAGNOSIS OF HERNIATION OF LUMBAR INTERVERTEBRAL DISKS

To the Editor:—Dr. Keegan (Diagnosis of Herniation of Lumbar Intervertebral Disks by Neurologic Signs, THE JOURNAL, Dec. 2, 1944, p. 808) describes a technic submitted to him by Dr. A. W. Abts in a personal communication. Disclaiming any intention to establish a prior use, or of any attempt to claim credit for devising the technic, I do put forth the simple statement that during my service in World War I, while on duty as a medical officer at Peter Bent Brigham Hospital, Boston, in 1918 and later at the Base Hospital at Camp Devens, Mass., I worked out a technic identical with that described by Dr. Keegan, the only variation being that with the knee fully flexed on the thigh and the thigh fully flexed on abdomen, instead of forcible and quick extension at this juncture of the procedure, a torsion movement of the knee is executed toward the opposite shoulder with both shoulders resting firmly on the table. At this point, or after this torsion maneuver has been executed two or three times to the point of tolerance of pain, a forcible extension is done with the full cooperation of the patient, who kicks out while the operator pulls on the ankle. The same procedure is carried out on the opposite side. I have used this technic continuously in private practice since that time for twenty-seven years. It has, with few exceptions, proved to be a valuable manipulation. In a small percentage of cases sufficient relaxation has not been possible without an anesthetic, and even with sodium pentothal the procedure is still a simple one and is a manpower hour saver, for the patients are sent right back to work. Furthermore, the relief experienced after the procedure keeps these patients out of the physical therapy department, thereby conserving man hours, and prevents many from becoming "body conscious." It certainly is true that it is much easier to rub disease into the back than to rub it out of the mind. Orthopedic men have been slow to recognize the role of the nucleus pulposus in low back pain. As a matter of fact orthopedic surgeons in many instances have "high browed" the suggestion of manipulation on the acutely strained back and are reluctant to go beyond the usual measures employed in acute low back pain, such as heat, massage and strapping. Dr. Keegan's series of 243 cases of herniation of the nucleus with 115 verified by operation should do much to emphasize and clarify the foggy conception that has so long existed in the profession concerning low back pains.

The flexion-torsion maneuver, I believe, not only has a tendency to increase the disk width posteriorly but widens the disk laterally as well; and, as Dr. Keegan has shown, the herniation is not directly against the posterior ligament but slightly laterally in the narrow angle of the canal against a special lateral portion of the ligamentum flavum, for which Dr. Keegan suggests the name interarticular ligament.

JOHN B. TYRRELL, M.D.
Southern Permanente Hospital,
Fontana, Calif.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, June 9, page 462.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, June 26-28. Sec., Dr. B. F. Austin, 519 Dexter Ave., Montgomery 4.

ALASKA: Juneau, September. Sec., Dr. W. M. Whitehead, Box 561, Juneau.

ARIZONA: * Phoenix, July 5-6. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

CALIFORNIA: *Oral.* Los Angeles, Aug. 11. *Written.* San Francisco, July 9-12. Sec., Dr. Frederick N. Scatena, 1020 N St., Sacramento 14.

COLORADO: * Denver, July 3-7. Final date for filing application is June 18. Sec., Dr. J. B. Davis, 831 Republic Bldg., Denver.

CONNECTICUT: * *Homeopathic.* New Haven, July 10-11. Sec., Dr. J. H. Evans, 1488 Chapel St., New Haven. *Medical. Examination.* New Haven, July 10-11. *Endorsement.* New Haven, July 24. Sec. to the Board, Dr. Creighton Barker, 258 Church St., New Haven.

DELAWARE: *Examination.* Dover, July 10-12. *Reciprocity.* Dover, July 17. Sec., Medical Council of Delaware, Dr. J. S. McDaniel, 229 S. State St., Dover.

FLORIDA: * Jacksonville, June 25-26. Sec., Dr. Harold D. Van Schaick, 2736 S. W. Seventh Ave., Miami 36.

GEORGIA: Atlanta and Augusta, June 18-20. Sec., State Examining Boards, Mr. R. C. Coleman, 111 State Capitol, Atlanta 3.

IDAHO: Boise, July 10. Dir., Bureau of Occupational Licenses, Miss Agnes Barnhart, 355 State Capitol Bldg., Boise.

ILLINOIS: Chicago, June 26-28. Superintendent of Registration, Department of Registration and Education, Mr. Philip Harman, Springfield.

INDIANA: Indianapolis, Aug. 28-30. Sec., Board of Medical Registration & Examination, Dr. W. C. Moore, 301 State House, Indianapolis 4.

KANSAS: Kansas City, June 26-27. Sec., Board of Medical Registration & Examination, Dr. J. F. Hassig, 905 N. Seventh St., Kansas City 10.

KENTUCKY: Louisville, June 18-20. Sec., State Board of Health, Dr. Philip E. Blackerby, 620 S. Third St., Louisville 2.

MAINE: Augusta, July 10-11. Sec., Board of Registration of Medicine, Dr. A. P. Leighton, 192 State St., Portland.

MARYLAND: *Medical.* Baltimore, June 19-22. Sec., Dr. J. T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, June 19-20. Sec., Dr. J. A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, July 10-13. Sec., Board of Registration in Medicine, Dr. H. Q. Gallupe, 413-F. State House, Boston.

MICHIGAN: * Detroit, June 26-28. Sec., Board of Registration in Medicine, Dr. J. E. McIntyre, 100 W. Allegan St., Lansing 8.

MINNESOTA: * Minneapolis, June 19-21. Sec., Dr. J. F. DuBois, 230 Lowry Medical Arts Bldg., St. Paul 2.

MISSISSIPPI: Jackson, June 25-26. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson 113.

MONTANA: Helena, Oct. 1-3. Sec., Dr. O. G. Klein, First Nat'l. Bank Bldg., Helena.

NEVADA: *Reciprocity.* Carson City, Aug. 6. Sec., Dr. G. H. Ross, 215 N. Carson St., Carson City.

NEW JERSEY: Trenton, June 19-20. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

NEW YORK: Albany, Buffalo, New York and Syracuse, June 25-28. Sec., Dr. Jacob L. Lochner, Education Bldg., Albany.

NORTH CAROLINA: Raleigh, June 18-20. Sec., Dr. Ivan Procter, Raleigh.

NORTH DAKOTA: Grand Forks, July 3. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OHIO: *Endorsement.* Columbus, July. *Examination.* Columbus, June 18-21. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

RHODE ISLAND: * July 5-6. Chief, Division of Examiners, Mr. Thomas Casey, 366 State Office Bldg., Providence.

SOUTH CAROLINA: Columbia, June 25-27. Sec., Dr. N. B. Heyward, 1329 Blanding St., Columbia.

SOUTH DAKOTA: * Pierre, July 17-18. Sec., Medical Licensure, State Board of Health, Dr. Gilbert Cottam, State Capitol, Pierre.

TEXAS: Houston, July 17-19. Sec., Dr. T. J. Crowe, 918-20 Texas Bank Bldg., Dallas 2.

VERMONT: Burlington, June. Sec., Dr. F. J. Lawliss, Richford.

VIRGINIA: * Richmond, June 20-23. Sec., Dr. J. W. Preston, 30½ Franklin Rd., Roanoke.

WASHINGTON: * Seattle, July 16-18. Sec., Department of Licenses, Miss Nell Adams, Olympia.

WEST VIRGINIA: Charleston, July 5-7. Commissioner, Public Health Council, Dr. John E. Offner, State Capitol, Charleston 5.

WISCONSIN: * Milwaukee, June 26-28. Sec., Dr. C. A. Dawson, Tremont Bldg., River Falls.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

NEBRASKA: Omaha, Oct. 2-3. Dir., Bureau of Examining Boards, Mr. Oscar F. Humble, 1009 State Capitol Bldg., Lincoln 9.

OREGON: Portland, July 7. Sec., Mr. C. D. Byrne, University of Oregon, Eugene.

RHODE ISLAND: Providence, Aug. 15. Chief, Division of Examiners, Mr. Thomas Casey, 366 State Office Bldg., Providence.

SOUTH DAKOTA: Yankton, June 19. Sec., Dr. G. M. Evans, Yankton.

TENNESSEE: Memphis and Nashville, June 18-19. Sec., Dr. O. W. Hyman, 874 Union Ave., Memphis.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1935 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Clinical Pathology, Baltimore

15:1-34 (Jan.) 1945

Micro Methods of Estimating Penicillin in Blood Serum and Other Body Fluids. A. Fleming.—p. 1.
Use of Fleming's Modification of Wright Slide Cell Technic for Determining Penicillin in Body Fludis. D. H. Heilman and W. E. Herrell.—p. 7.
Schistosomiasis (Bilharziasis) and Egyptian Splenomegaly. H. K. Giffen.—p. 10.
Actinomycosis Due to Nocardia Asteroides: Report of Case. C. H. Binford and J. D. Lane.—p. 17.
Laboratory Anticipation of Sulfonamide Resistance in Gonorrhea, with Associated Study of Hospital Days Saved by Prompt Penicillin Therapy. R. A. Sloan, R. D. Baker and B. W. Fraser.—p. 24.
Erythema Multiforme Bullosum Following the Use of Sulfadiazine. V. J. Dardinski.—p. 28.

American J. Digestive Diseases, Fort Wayne, Ind.

12:97-150 (April) 1945

Pathology of Regional Ileitis. G. W. H. Schepers.—p. 97.
Gastric Acidity in Apparently Healthy Individuals. C. S. Smith, Helen L. Wikoff and M. E. Southard.—p. 117.
Malnutrition Causing General Lowered Tissue Resistance and Local Tissue Pathology. Elizabeth Steele.—p. 119.
New X-Ray Method of Studying Anatomy and Motility of Stomach and Duodenum: Its Diagnostic Value. W. F. Gruber.—p. 127.
Common Features of Chronic Amebic Colitis. J. P. Lopes Pontes.—p. 137.
Action of Ketocholanic Acids on Lower Bowel Motility. M. M. Dasco, K. Zeltmacher and S. Shapiro.—p. 142.

American J. Obstetrics and Gynecology, St. Louis

49:307-454 (March) 1945. **Partial Index**

*Carcinoma of Cervix and Pregnancy: Clinical Study of Eight Cases. A. J. Kobak, J. E. Fitzgerald, V. C. Freda and L. Rudolph.—p. 307.
*Androgenic Therapy in Malignant Disease of Female Genitalia: Preliminary Report. S. Abel.—p. 327.
Development and Degeneration of Ovum and Follicle as Observed by Intravital Staining. E. O. Strassmann.—p. 343.
Papillary Lesions of Cervix Uteri in Pregnancy. H. A. Edmondson, L. M. Levi, N. Evans and Paula Horn.—p. 356.
Manual Removal of Placenta: Policy of Treatment. M. E. Aaberg and D. E. Reid.—p. 368.
Noninvolution of Placental Site. R. N. Rutherford and A. T. Hertig.—p. 378.
Influence of Stilbestrol on Lactation. H. Fields.—p. 385.
Catheter Method for Continuous Caudal Anesthesia. G. C. Downing, M. Miller and R. B. Durfee.—p. 391.
Similarity of Mouth and Vulvar Lesions. J. Parks.—p. 396.
Five Hundred Consecutive Cesarean Section Operations. E. G. Free.—p. 401.
Maternal Morbidity. W. G. Cummings.—p. 409.
Hirsutism in Pregnancy. F. J. Stoddard.—p. 417.
Hysterosalpingography as Diagnostic Aid in Certain Types of Ruptured Uteri. J. B. Sheffery.—p. 423.
Bilateral, Multilocular, Pseudomucinous Cysts of Ovaries Necessitating Cesarean Section. A. H. Kanter.—p. 428.
Placenta Delivered Five Hours Before Birth of Fetus. R. Torpin.—p. 438.
Fetus Adipocere Monster. J. J. Gill.—p. 440.

Cervical Carcinoma and Pregnancy.—Kobak and his associates have seen 8 cases of concurrent cervical carcinoma and pregnancy during the last five years at the Cook County Hospital in Chicago. The youngest of the patients was 25, the oldest 43 years of age. In 7 patients the growth was a stratified squamous cell carcinoma and in 1 patient it was an adenocarcinoma. There is a tendency to regard carcinoma of the cervix during pregnancy as so improbable that other causes of bleeding are given precedence in diagnosis and therapy. The growth is thus diagnosed more often toward the end of pregnancy when it has achieved large proportions. Carcinoma of the cervix develops at a rapid pace during pregnancy. The treatment depends on the disposition of the pregnancy. In the first trimester the pregnancy is disregarded and high voltage x-ray therapy is instituted. With the death of the fetus, radium is added to the treatment. In advanced pregnancy the cervix should be spared the injuries that occur during parturition. If there is no infection a classic cesarean section is performed to prevent cervical trauma and to leave intact the fundal portion of the uterus to facilitate radium therapy, which is started after uterine involution has occurred. A total of 4,500 mg. hours of radium is given in three equally divided doses. As soon after the delivery of the baby as possible, high voltage x-ray treatments are started and are continued for a long time. In the presence of local infection a Porro cesarean section is preferred. In pregnancies close to viability the cesarean section may be deferred, and 1,500 to 3,000 mg. hours of radium may be given to the cervix to inhibit temporarily the progress of the new growth. The ultimate prognosis for the patient depends on the persistent continuation of the high voltage x-ray and radium therapy that is instituted after the disposition of the pregnancy.

Androgenic Therapy in Malignant Disease of Female Genitalia.—Abel directs attention to the difficulty of selecting patients for treatment with androgen because to withhold for experimental purposes any of the accepted modes of treatment to patients with early carcinoma was unjustified. Endocrine therapy had to be reserved for those patients who failed to respond to orthodox forms of treatment and for whom it was felt that nothing more could be accomplished. From 140 to 150 mg. of testosterone propionate was given by mouth every week (two 10 mg. tablets daily) or the patients were given three 50 mg. injections a week intramuscularly. The first 5 patients, including 3 with carcinoma of the cervix and 2 with carcinoma of the corpus, have been receiving testosterone propionate for ten months. Symptomatically these patients have been definitely improved. A feeling of well being, improved morale, control of menopausal symptoms and increased libido have all been regularly observed. No regression or even retardation of the malignant process was noted.

49:455-602 (April) 1945

Differential Psychology of American Woman. W. R. Cooke.—p. 457.
Spasmolysant Action of Magnesium Ions on Tetanically Contracting Human Gravid Uterus. A. R. Abarbanel.—p. 473.
Hysterectomy with Preservation of Ovarian Tissue in Treatment of Endometriosis. B. Z. Cashman.—p. 484.
Surgical Complications During Pregnancy and Labor. W. A. Scott.—p. 494.
Pregnancy Following Myomectomy. R. D. Mussey, L. M. Randall and L. W. Doyle.—p. 508.
Rupture of Uterus. F. J. Lynch.—p. 514.
Uterine Defense Mechanism Against Infection. J. R. Goodall.—p. 532.
*Wertheim Operation for Carcinoma of Cervix. J. V. Meigs.—p. 542.
Mortality Study of 187 Deaths in 66,376 Live Births. J. F. Norton.—p. 554.
Observation on Breech Deliveries in General Hospital. M. G. Potter, H. W. Erving and J. B. Brown.—p. 567.
Critical Analysis of Twenty-Two Years' Experience with Cesarean Section. R. A. Johnston.—p. 576.
Prolapse of Urethra Treated by Hepburn Operation. J. R. Miller.—p. 591.

Wertheim Operation for Cervical Carcinoma.—Sixty-five patients form the basis for this report. Patients selected for the operation should be young, preferably below 50 years of age and in good physical condition. Obese women should not be chosen. The tumor may involve the cervix in part or entirely; it may advance on the vaginal walls to not over 1 cm. from the cervix. The cervix should be movable, as felt by vagina and by rectum; fixation must mean infiltration beyond the cervix, and, although the lesion can be removed, lymphatics full of cancer cells cannot. Palpation of lymph nodes in the iliac, ureteral or obturator regions is no excuse for not operating if the other reasons for selection are satisfactory. It is exactly in such cases that there is hope for cure by means of radical surgery. The operation is the classic Wertheim or Clark operation, which involves a complete dissection of the pelvic lymph nodes from the bifurcation of the aorta down, plus the removal of the cervix, vagina and parametrium. Meigs prefers to call this operation the Wertheim-Clark plus the Taussig operation. The only really serious and annoying complication is damage to the ureter and consequent ureterovaginal

fistula. There was no postoperative mortality. Five of the 65 patients are known to be dead and in 3 of the 5 the lymph nodes had become involved. Of the 53 patients who were free from lymph node involvement only 2 have died. Surgical removal of early cervical cancer is as safe as radiation treatment. The number of fistulas of the ureterovaginal type is still too large, but with a better understanding of the blood supply fewer such calamities are expected. Lymph node involvement is curable by surgery.

American Journal of Psychiatry, New York

101:429-572 (Jan.) 1945. **Partial Index**

Psychiatry of Benjamin Rush. R. H. Shryock.—p. 429.
Contrast Between Electroencephalograms of 100 Psychoneurotic Patients and Those of 500 Normal Adults. Mary A. B. Brazier, J. E. Finesinger and S. Cobb.—p. 443.
Seven Year Survey of Insulin Treatment in Schizophrenia. A. Gralnick.—p. 449.
Cerebral Metabolism in Patients with Depression. H. E. Himwich, E. Cameron, E. Homburger and F. Feldman.—p. 453.
Comparative Study and Evaluation of Electric Shock Therapy in Depressive States. K. J. Tillotson and W. Sulzbach.—p. 455.
Personalities of American Psychotherapists: Mitchell, Salmon, Riggs. Margaret C. L. Gildea and E. F. Gildea.—p. 460.
Psychiatric Rehabilitation Therapy. T. A. C. Rennie.—p. 476.
Psychiatric Investigation in Britain. A. Lewis.—p. 486.
Military Group Psychotherapy. H. P. Rome.—p. 494.
Group Psychotherapy in War Neuroses. L. A. Schwartz.—p. 498.
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Psychiatric Practice Aboard Hospital Ship in Combat Area. D. L. Farnsworth and R. S. Wigton.—p. 504.
Psychoses in Naval Officers: Plea for Psychiatric Selection. Z. M. Lebensohn.—p. 511.
Psychoneuroses, Combat-Anxiety Type. R. B. McElroy.—p. 517.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

53:213-318 (March) 1945

Pathology of Anomalies Found in Knee Joints. S. H. Nickerson.—p. 213.
Spondylolisthesis: Commentary on Etiology, and Improved Method of Roentgenographic Mensuration and Detection of Instability. I. Meschan.—p. 230.
Pleuritic Involvement Associated with Primary Atypical Pneumonia: Roentgenographic and Clinical Study. A. L. Bachman, N. O. Sara and H. E. Mantz.—p. 244.
Evaluation of Teleroentgenographic Mensuration and Cardiac Roentgenoscopy in Diagnosis of Early Mitral Valve Disease. B. S. Epstein.—p. 259.
Elongation and Tortuosity of Descending Aorta in Case of Right Aortic Arch, Simulating a Right Sided Pulsating Mediastinal Mass. M. Szabados.—p. 270.
Congenital Hydronephrosis Caused by Polar Artery: Report of Case. E. Ingber.—p. 273.
Aberrant Pancreatic Tissue as Roentgenologic Problem. G. J. Baylin.—p. 277.
*Necrotizing Bronchopneumonia: Its Relation to Radiation Therapy of Cancer of Oral Cavity. L. V. Ackerman, H. M. Wiley and D. V. LeMone.—p. 281.

Necrotizing Bronchopneumonia.—Ackerman and his associates maintain that necrotizing bronchopneumonia and necrotizing suppurative bronchopneumonia are more descriptive and accurate terms than aspiration pneumonia. Necrosis of the bronchial walls and suppuration of the lung parenchyma supplied by the involved bronchus or bronchi are invariably present. The distribution is lobular and localized to one or more bronchopulmonary segments. Patients with cancer of the oral cavity are likely to develop this complication, particularly if the lesion interferes with deglutition. The authors present observations on 14 patients with necrotizing pneumonia. Three had primary carcinoma of the tongue, 2 of the lip, 3 of the buccal mucosa, 5 of the larynx and 1 of the gum. Twelve of these patients died after completion of treatment, the shortest time interval before death being three days and the longest period eleven months. The 2 remaining patients, whose clinical symptoms and x-ray findings strongly suggest necrotizing bronchopneumonia, are well. Necrotizing pneumonia can occur during, immediately after or relatively late after radiotherapy to cancer of the oral cavity and larynx. The clinical symptoms and signs are typical. A high pulse rate with a relatively low grade fever is of particular significance. The x-ray appearance is characteristic and the differential diagnosis is not difficult, provided adequate knowledge of the historical and clinical aspects is available. The most important preventive measure is carefully planned roentgen therapy, with particular attention to divided dose technic, selection of fields and adequate filtration. If necrotizing bronchopneumonia is diagnosed early roentgen therapy may be effective, but in late cases no treatment will be of value.

American Journal of Surgery, New York

68:1-138 (April) 1945

Surgical Management of Vascular Trauma. H. L. Pugh.—p. 5.
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Inversion of Appendical Stump: Improved Method. J. J. Stratte.—p. 91.
*Air Embolism in Obstetrics and Gynecology. W. F. Finn.—p. 100.

Air Embolism Following Tubal Insufflation.—A woman aged 28 was admitted for tubal insufflation because of sterility of four years' duration. On the twenty-first day of the menstrual cycle she was anesthetized with nitrous oxide and ether. After the uterine cavity had been sounded at 9 cm., passage of gas at 80 to 100 mm. was heard on two occasions. Curettage was performed and 0.5 cc. of tissue grossly characteristic of secretory endometrium was obtained. About twenty minutes after the start of the operation the patient had difficulty in breathing. Respirations had ceased and only a feeble carotid pulse could be obtained. Resuscitation and stimulants were used without avail. Necropsy revealed a patent left tube, stenosis in the outer third of the right tube and 25 cc. of air in the right ventricle and pulmonary arteries. Finn reviews 4 similar cases of fatal air embolism following tubal insufflation which had been reported before and stresses that, because of the danger of air embolism, tubal insufflation should not be performed in the premenstrual phase, nor should a curettage be done simultaneously.

Annals of Surgery, Philadelphia

121:385-544 (April) 1945

Treatment of Carcinoma of Colon. F. A. Coller and H. H. Vaughan.—p. 395.
Method of Reestablishing Continuity Between Bile Ducts and Gastrointestinal Tract. A. W. Allen.—p. 412.
Primary Carcinoma of Gallbladder. J. M. T. Finney and M. L. Johnson.—p. 425.
Nonsuture Method of Blood Vessel Anastomosis. A. H. Blakemore and J. W. Lord, Jr.—p. 435.
End Results in Treatment of Hyperparathyroidism. R. D. McClure and C. R. Lam.—p. 454.
Cases of Severe Pelvic Injury. L. G. Lewis.—p. 470.
*Studies on Traumatic Shock: V. Treatment of Clinical Shock with Gelatin. E. I. Evans and H. S. Rafel.—p. 478.
Pentothal-Metrazol Antagonism: Method of Shortening Recovery Period Following Pentothal Anesthesia: Clinical and Experimental Study. K. L. Pickrell.—p. 495.
*Heparin in Abdomen: Clinical Report. F. M. Massie.—p. 508.
Methods of Constructing a Vagina. L. Brady.—p. 518.
Spontaneous Perforation of Rectovaginal Septum Five Weeks After Construction of Vagina: Case Reports. L. R. Wharton.—p. 530.
Intervertebral Disk Lesions Are Most Common Cause of Low Back Pain With or Without Sciatica. J. A. Key.—p. 534.

Treatment of Clinical Shock with Gelatin.—Evans and Rafel used gelatin in the treatment of 67 patients who were in shock because of trauma to the extremities, chest and abdomen, and of 28 severely burned patients. Gelatin for intravenous use is prepared by hydrolysis; if certain precautions are observed, a product of rather unusual uniformity as regards viscosity and molecular homogeneity can be obtained. Studies have made it clear that for intravenous use not "any" gelatin solution will suffice. Tourtelotte supplied the authors with two types of gelatin solution, the "lightly" and the "heavily degraded." The heavily degraded gelatin leaves the blood rapidly, while most of the lightly degraded gelatin is still present in the blood stream at the eighth hour after rapid infusion. Only by the "rapid syringe technic" have the authors

found it possible to restore rapidly and adequately the circulating blood volume of many severely shocked patients. Blood volume determinations and hematocrit estimations were made on many patients. That shock was due mainly to the decreased circulating blood volume was borne out by these laboratory investigations and also by the recovery of large quantities of whole blood in many of the patients operated on. Experience with gelatin in the management of burn shock has been very satisfactory. The present plan of management is to reserve its use for the first twenty-eight to forty-eight hour period, when burn shock is most to be feared, and then give whole blood.

Intra-Abdominal Use of Heparin.—Lehman and Boys found that best results are obtained by administering heparin at the close of an abdominal operation and by paracentesis every twelve hours for three days. Massie used this method with a slightly modified technic in 7 cases. After the first operating room dose he gives 10,000 units every twelve hours until a total of 40,000 units has been given. The postoperative course was stormy in most of the cases. Intra-abdominal heparin to prevent obstructing adhesions should be limited to patients who have had one or more operations for obstruction or repeated attacks following abdominal surgery. The hazards are hemorrhage, infection and possibly delay in wound healing. The contraindications to its use are recent abdominal surgery, incomplete hemostasis and intestinal resection. The hazards should be recognized promptly and can be checked by blood transfusion. Red cell and hemoglobin determinations, blood pressure reading and the general appearance of the patient are better guides than coagulation time tests. Accidental opening of the bowel during the dissection of adhesions is not a contraindication for heparin administration. In this small series there has been complete absence of obstruction in the months and years following the use of heparin in the abdomen.

Archives of Internal Medicine, Chicago

75:145-214 (March) 1945

Sporotrichosis in New York State: Report of 2 New Cases and Tabulated Discussion of 26 Previous Ones. G. W. Leiby, M. B. Sulzberger and R. L. Baer.—p. 145.
Hepatolenticular Degeneration: Report of 2 Cases with Predominantly Hepatogenic Symptoms, 1 Associated with Cruveilhier-Baumgarten Syndrome. E. E. Wollaeger and H. C. Shands.—p. 151.
*Efficacy of Some Drugs and Biologic Preparations as Therapeutic Agents for Tularemia. J. F. Bell and O. B. Kahn.—p. 155.
*Clinical Features of Relapsing Plasmodium Vivax Malaria in Soldiers Evacuated from South Pacific Area. H. H. Gordon, S. W. Lippincott and others.—p. 159.
Absorption, Excretion and Distribution of Sulfamethazine. I. F. Volini, Gertrude M. Engbring and Hildegarde A. Schorsch, with the technical assistance of Kathleen O'Donnell.—p. 168.
*Occlusion of Hepatic Veins: Review of 20 Cases. M. P. Kelsey and M. W. Comfort.—p. 175.
Dengue-like Fever Occurring in Iowa During Poliomyelitis Epidemic of 1943. W. D. Paul, E. H. Antes and A. L. Sahs.—p. 184.
Primary Splenic Neutropenia. H. M. Rogers and B. E. Hall.—p. 192.
Vascular Diseases: Tenth Annual Review. T. R. Van Dellen, G. W. Scupham, Geza de Takats and E. F. Fowler.—p. 197.

Therapy of Tularemia.—Bell and Kahn administered the following therapeutic agents to guinea pigs infected with tularemia: sulfanilamide, sulfadiazine, sulfamerazine, acriflavine, metaphen, iodide and bismuth (iodobismitol with saligenin), arsenic and bismuth (solution of bismuth subgallate and sodium para-aminophenyl arsonate), trivalent arsenic alone (oxophenarsine hydrochloride), antimony (stibophen), penicillin and hyperimmune equine antitularemic serum. These drugs were used in amounts which proportionately exceeded the doses given human patients. Therapeutic trials did not demonstrate any advantage in employing these drugs.

Relapsing Plasmodium Vivax Malaria in Soldiers from South Pacific.—Gordon and his associates describe the clinical features of relapsing Plasmodium vivax malaria in 435 soldiers evacuated to the United States from the South Pacific area. During observation at Harmon General Hospital a total of 421 clinical attacks occurred in 295 or 68 per cent of the 435 patients. Of the 139 patients with no attacks, 47 had been observed for only one month. Chills were frequent; in only 12 per cent was there neither chill nor chilly feeling. There were headache, backache and generalized aches, malaise and weakness, nausea and vomiting, herpes labialis and cerebral symptoms. The spleen and liver could be palpated in 23 and 11 per cent respectively. In 313 attacks treated solely with quinacrine, fever subsided promptly. The effect of quinacrine hydrochloride on the incidence of positive malarial smears was studied in 200 patients. All patients had positive smears before treatment was started. On the fourth day after quinacrine had been started only 1 per cent still had positive smears. The great efficacy of quinacrine in controlling symptoms and fever is thus a reflection of its effect on parasitemia. All except one of the attacks observed were due to P. vivax. The need for a program of rehabilitation became obvious. A majority of the patients had somatic complaints for which no definite organic cause could be found. There is evidence that the rate of relapse of malaria decreases as time goes on.

Occlusion of Hepatic Veins.—According to Kelsey and Comfort the records of all cases in which necropsy was done at the Mayo Clinic from 1910 to 1939 inclusive has disclosed 20 cases of occlusion of the hepatic veins. In 16 cases the occlusion was an incidental finding at necropsy and had not produced recognizable symptoms. In 4 cases it had caused symptoms, and in 3 of these it had contributed to or been the chief cause of death. The occlusion was in all cases due to thrombosis. Thrombosis of the hepatic veins is not so rare that it can be dismissed entirely as a diagnostic possibility. In the chronic forms of the disease the progressive course, in some cases punctuated by acute episodes, the relatively rapid increase in the size of the tender liver and the severe epigastric pain extending to the thoracic or the lumbar region should arouse suspicion that some unusual condition, such as thrombosis of the hepatic veins rather than cirrhosis or carcinoma of the liver, is the cause of the symptoms. Peritoneoscopy may eventually serve to distinguish the congested liver of obstruction of the hepatic veins from the cirrhotic or carcinomatous liver. Hepatosplenomegaly in a case in which evidence of thrombosis of the inferior vena cava has been present will suggest extension of the thrombosis to the hepatic veins. Examination of the direction of the flow of blood in the collateral circulation will aid in the differentiation of obstruction of the hepatic veins and obstruction of the inferior vena cava. An upward flow indicates obstruction of the inferior vena cava, a downward flow obstruction of the hepatic veins. In cases of more acute occlusion of the hepatic veins as well as in the acute terminal episodes of the chronic form of the disease the rapidity of increase in the size of the liver together with evidence of profound disturbances of hepatic function and of portal obstruction that could be caused only by some rapidly developing process, such as thrombosis, may well suggest the correct diagnosis. Acute occlusion has been confused with acute pancreatitis, but elevation of values for serum amylase as well as rapid enlargement of the liver and rapid development of portal obstruction should materially aid in distinguishing the two conditions.

Archives of Neurology and Psychiatry, Chicago

53:257-328 (April) 1945

Studies on Pain: "Spread of Pain"; Evidence on Site of Spread Within Neuraxis of Effects of Painful Stimulation. B. S. Ray and H. G. Wolff.—p. 257.
*Edema and Trophic Disturbances of Lower Extremities Complicating Prefrontal Lobotomy. L. H. Ziegler and C. W. Osgood.—p. 262.
Organic Psychotic Syndromes Occurring During Electric Convulsive Therapy. L. B. Kalinowsky.—p. 269.
Origin of Spike and Wave Pattern of Petit Mal Epilepsy: Electroencephalographic Study. J. B. Hursh.—p. 274.
Electroencephalographic Study of Prefrontal Lobotomy: Study of Focal Brain Injury. R. Cohn.—p. 283.
Transtentorial Herniation of Brain Stem: Characteristic Clinicopathologic Syndrome: Pathogenesis of Hemorrhages in Brain Stem. I. M. Scheinker.—p. 289.
Lipoma of Brain: Report of Cases. G. J. Ehni and A. W. Adson.—p. 299.
Bromine Content of Blood in Mental Diseases: I. Dementia Precox. Helen L. Wikoff, R. L. Martin and T. R. Marvin.—p. 305.
Skull Defect and Herniation of Cerebrum with Absence of Dura Following Head Injury in Adolescence. W. S. McCune and B. Woodhall.—p. 307.
Myelitis Complicating Measles. L. A. Senseman.—p. 309.

Edema of Lower Extremities Complicating Prefrontal Lobotomy.—Two of the older patients among 19 on whom prefrontal lobotomy had been performed died of pneumonia while convalescing from the operation. Still another had acute

collapse of a lung soon after the lobotomy but recovered. Immediately after operation all had rectal and vesical incontinence. Ten of the 17 survivors continue to have occasional sphincter accidents. Postoperative observations on these 17 patients revealed that 8 had complications referable to the legs and feet, mostly edema associated with tenderness. In some patients bullae developed about the heels at areas most vulnerable to pressure. Ziegler and Osgood emphasize that alteration of the vascular supply of the brain may be responsible for the functional impairment of structures at a considerable distance from the vascular defect. The anterior cerebral artery courses backward over the mesial surface of the brain, sending branches laterally, upward and posteriorly to supply the gray and white matter of a narrow volume of the cerebrum adjacent to the mesial surface, as far back as the parieto-occipital sulcus. Some branches of the anterior cerebral artery supply the anterior portion of the thalamus, the basal ganglions and a part of the internal capsule. Small branches of the anterior cerebral artery might suffer interruption by the lobotomy, with consequent damage to cortical association fibers and even the cortex itself. The anterior cerebral artery and its possible anomalies deserve renewed investigation. Milroy's disease (familial hereditary edema) and other obscure edemas of the feet and legs, as well as bullae, may be found to have a causative factor in the central nervous system, and it may well be discovered that enuresis is more than a defective habit.

Archives of Ophthalmology, Chicago

33:173-264 (March) 1945

Ocular Effects of Altitude Flying and of Deep Sea Diving. L. D. Carson.—p. 173.
*Herpes Simplex Keratitis in Malaria: Clinical and Experimental Study. W. P. Chamberlain Jr. and L. H. Bronson Jr.—p. 177.
Toxoplasmosis: Report of Ocular Findings in Infant Twins. P. Heath and W. W. Zuelzer.—p. 184.
Factors Affecting Hemorrhage Following Extractions of Cataracts. E. E. Neff.—p. 192.
Glaucoma Due to Peripheral Anterior Synechias After Operation for Cataract. P. C. Kronfeld and J. S. Haas.—p. 199.
Retrolental Fibroplasia in Premature Infants. V. Further Studies on Fibroplastic Overgrowth of Persistent Tunica Vasculosa Lentis. T. L. Terry.—p. 203.
Two Unusual Ocular Tuberculomas. P. H. Boshoff and E. Grasset. —p. 209.
Intravitreal Penetration of Penicillin and Penicillin Therapy of Infections of Vitreous. I. H. Leopold, with the technical assistance of Marjorie Wiley.—p. 211.
Cyclopia Completa and Arhinencephalia Completa with Umbilical Hernia in Full Term Child: Report of Case. J. E. Kindred.—p. 217.
Development of Galactose Cataract in Albino Rat Embryo. Stephanie L. Bannon, Roberta M. Higginbottom, Jeannette M. McConnell and Helen W. Kaan.—p. 224.
Frequency and Location of Punctate Opacities in 300 Young Crystalline Lenses. J. Bellows.—p. 229.
Total Herpes Zoster of Ophthalmic Maxillary and Mandibular Divisions of Trigeminal Nerve: Report of Case in Which There Was Also Involvement of Geniculate Ganglion and Vestibular Portion of Eighth Cranial Nerve. H. O'Neill—p. 237.

Herpes Simplex Keratitis in Malaria.—Chamberlain and Bronson encountered among troops who have contracted malaria in tropical combat areas numerous instances of keratitis due to herpes simplex virus. These infections have frequently resulted in serious scarring of the cornea, and the ulcers have been prone to recur with successive attacks of malaria. Plasmodium vivax was demonstrated in blood smears from 13 patients who had keratitis associated with herpes simplex and who had been exposed to malaria. In each patient the onset of corneal ulceration followed shortly after an acute malarial recurrence. The incidence of dendritic keratitis in the malaria group was 1 in each 188 new patients examined in the ophthalmologic clinic, whereas among patients not exposed to malaria the incidence was 1 in each 1,100 new patients. Corneal infection associated with herpes simplex would seem to be about six times as frequent among troops infected with malaria. Sulfadiazine powder applied locally to 5 dendritic ulcers promoted rapid healing in each instance. In 4 cases of atypical recurrent herpetic ulcers sulfadiazine was of no demonstrable benefit. Results suggest that sulfadiazine may prove a satisfactory adjunct to the accepted treatment of dendritic keratitis with strong solution of iodine U. S. P. Local applications of sulfanilamide were of no value. From the cornea of each of 2 patients with recurrent malarial attacks and dendritic keratitis the causative agent was transferred to a rabbit's cornea and thence to the chorioallantoic membrane of a chick embryo, where characteristic lesions of herpes simplex virus were produced. The identity of the virus was confirmed by neutralization tests. When the skin was tested for sensitivity to herpes simplex antigen, positive responses were obtained in about 80 per cent of a sample of hospitalized adult patients, and there was no appreciable difference in incidence between malarial and nonmalarial patients. Thirteen patients with herpes simplex keratitis were shown by neutralization tests to have serum antibodies against a known strain of herpes simplex virus. Each of these patients gave a strongly positive cutaneous reaction to the herpes simplex antigen.

Archives of Pathology, Chicago

39:133-220 (March) 1945

Experimental Nephropathies: II. Renal Phosphatase After Poisoning with Mercury Bichloride, Uranyl Nitrate and Potassium Dichromate. O. E. Hepler, Helen Gurley and J. P. Simonds.—p. 133.
Ischiopagus Tripus: Report of 2 Cases. H. G. Schlumberger and J. E. Gotwals.—p. 142.
Studies on Pathogenesis of Glomerulonephritis: I. Production of Autoantibodies to Kidney in Experimental Animals. P. A. Cavelti and Else Staehelin Cavelti.—p. 148.
Cysts and Cystic Tumors of Mediastinum. T. C. Laipply.—p. 153.
Some Endocrinologic Considerations of Canine Neoplastic Diseases. R. M. Mulligan.—p. 162.
Theory of Transposition of Arterial Trunks Based on Phylogenetic and Ontogenetic Development of Heart. M. Lev and O. Saphir. —p. 172.

Archives of Surgery, Chicago

50:125-176 (March) 1945

Chronic Thyroiditis and Primary Thyrotoxicosis (Exophthalmic Goiter). K. I. Gürkan.—p. 125.
Continuous Spinal Anesthesia: Observations on 1,200 Patients. R. C. Martin, H. Livingstone and V. Wellman.—p. 130.
Thromboplastic Reagent: Development of More Suitable Preparation for Measuring Accelerated Clotting Tendency and for Use Following Administration of Dicoumarin (3,3'-Methylene-Bis-[4-Hydroxycoumarin]). C. E. Brambel.—p. 137.
*Transplantation of Epiphysial Cartilage. H. L. Wenger.—p. 148.
*Blocking of Middle Cervical and Stellate Ganglions with Descending Infiltration Anesthesia: Technic, Accidents and Therapeutic Indications. A. DeSousa Pereira.—p. 152.
Protein Metabolism During Convalescence After Trauma: Recent Studies. J. E. Howard.—p. 166.
Use of Omentum to Close Perforations of Stomach. P. B. Price and T. F. Lee.—p. 171.
Cyste of Urachus. C. F. Sawyer.—p. 174.

Transplantation of Epiphysial Cartilage.—A boy now 11 years old was injured when at the age of 3 years some one stepped on his foot with a high heel. Cellulitis developed and operation revealed osteomyelitis of the first metatarsal bone. In response to the Orr treatment the patient rallied, but extreme shortening of the large toe and pronation of the foot resulted. Four years later epiphysial cartilage from a fibula, containing a portion of diaphysis, was successfully transplanted to the first metatarsal bone. The toe, which was greatly shortened prior to operation, was immediately corrected by the transplant. Observations made over approximately three years show that the transplant has taken and is functioning physiologically. The metatarsal bone in the foot which was operated on is of exactly the same size as the bone in the opposite foot. The proximal portion of the epiphysis appears to have fused with the cuneiform bone without impairing the growth of bone, which takes place more distally. Wenger cannot prophesy the eventual fate of the transplant at this time, but the extremely gratifying results obtained to date give assurance that this procedure is valuable.

Blocking of Middle Cervical and Stellate Ganglions.—Pereira blocks the middle cervical and stellate ganglions by an anterior approach. This method has the following advantages: 1. It is devoid of the risk of vascular and pleuropulmonary accidents. 2. It has a deep point of osseous reference, easy to identify by palpation of the transverse process of the sixth cervical vertebra. 3. The maximum effect is produced by blocking not only the stellate ganglion but the intermediate and the middle cervical ganglion. He arrived at obtaining without accidents a block of the middle cervical, intermediate and stellate ganglions by descending infiltration anesthesia of these ganglions, with the needle inserted at the level of the base of the anterior surface of the transverse process of the sixth cervical vertebra. If the anesthetic does not diffuse downward suffi-

ciently to block completely the stellate ganglion, the needle must be inserted a second time and directed to the base of the transverse process of the seventh cervical vertebra, and the anesthetic must be injected close to the intermediate ganglion and the vertebral artery. In this manner one can obtain a safe block of the middle cervical, intermediate and stellate ganglions.

Bulletin New York Academy of Medicine, New York

21:171-222 (April) 1945

*Diverse Clinical Picture of Coronary Heart Disease. L. R. Levy. —p. 171.
Treatment of Coronary Disease. C. C. Wolferth.—p. 185.
*Use of Concentrated Human Serum γ-Globulin in Prevention and Attenuation of Measles. C. A. Janeway.—p. 202.

Coronary Heart Disease.—Levy stresses the diversity of manifestations of coronary heart disease. There may be minimal symptoms and pronounced changes in the form of the electrocardiogram. In the presence of advanced coronary sclerosis a severe emotional strain can induce acute coronary insufficiency and so cause sudden death. The electrocardiogram may be normal less than twenty-four hours before fatal coronary occlusion. There may be striking serial changes in the electrocardiogram indicating closure of coronary arteries in a patient who is ambulatory, active and entirely free from cardiac discomfort. When the symptoms are puzzling and the examination, including the electrocardiogram, reveals no signs of heart disease, the anoxemia test is often useful in affording graphic evidence of a diminished coronary reserve. This consists in permitting the patient to breathe a mixture of 10 per cent oxygen and 90 per cent nitrogen for twenty minutes or until cardiac pain appears. A control electrocardiogram is taken and records are made at intervals of five minutes while the patient breathes the low oxygen mixture. Measurement of these records shows in patients with a diminished coronary reserve characteristic changes which are not observed when the coronary blood flow is adequate.

Concentrated Human Serum Gamma Globulin in Measles.—Janeway demonstrated that concentrated human serum gamma globulin derived from blood collected by the American Red Cross contains a twenty-five-fold concentration of most of the antibodies present in normal adult serum. This makes it possible to give the equivalent of 125 cc. of pooled adult serum in a single intramuscular injection of 5 cc. This material is now being distributed by the American Red Cross, through public health agencies, for the prevention and modification of measles, a purpose for which it has been proved particularly effective and safe. When administered in the first six days after exposure to measles, a dose of 0.08 to 0.1 cc. per pound will give protection to 3 out of 4 persons, with mild measles in the fourth, while a dose of one fourth this much, or 0.02 to 0.025 cc. per pound, will result in an attack of mild measles in most cases. In a large series of cases, very few reactions to intramuscular injection of the globulin have been observed, and these have been mild and chiefly local. The complication rate in modified measles appears to be definitely lower than in the typical disease.

Bull. of the U. S. Army Med. Dept., Washington, D. C.

87:1-122 (April) 1945

Penetrating War Injuries of Brain: Desirability of Early Definitive Surgery. A. I. Finlayson.—p. 61.
Treatment of Skin Diseases in Tropics. T. W. Clark.—p. 70.
Tourniquet Problems in War Injuries. L. H. Wolff and T. F. Adkins. —p. 77.
Repair of Fixed Bridges and Acrylic Dentures in Field. M. Arnold and A. Baranowski.—p. 85.
Introduction to Psychiatric Problems. J. J. Michaels and C. Smith. —p. 87.
Venereal Disease Control Program. L. L. Heimoff.—p. 93.
Perennial Bronchial Asthma: Analysis of 100 Cases. P. E. Zanfagna. —p. 100.
Diagnosis of Schistosomiasis. V. Vermooten.—p. 104.
*Air Blast Injury: Report of Cases. R. E. Brubaker.—p. 110.
Contact Poison Plants in Old World Tropics. E. D. Merrill.—p. 115.

Air Blast Injury.—Brubaker reports observations on 15 patients suffering from the percussive effects of high explosives. In 3 patients pain and hyperesthesia were presumably due to a traumatic peripheral neuritis of the supraorbital nerve. Injection of the supraorbital nerve with procaine produced complete although transient relief. Two patients had hypersensitiveness of the skin of root distribution. In cases with supraorbital pain and hyperesthesia it is possible that the nerve was contused at its exit from the supraorbital canal. In the treatment of critical pulmonary blast injuries strict bed rest and limitation of motion are necessary. Plasma is rarely indicated for the accompanying shock because increase in the intravascular hydrostatic pressure resulting from the introduction of plasma augments the outpour of fluid and thus hastens death. The chief problem is to tide the patient over the acute transudative phase of the injury by preventing loss of circulating fluid into the lungs. This might be accomplished by exhalation against positive pressure as provided by a type of intermittent flow mask such as that designed by Barach. It is possible that such pressure on exhalation might stem the transudation of fluid into the alveoli in blast injury, thus preventing the anoxia resulting from the loss of absorptive surface and, at the same time, the shock secondary to the diminution of circulating fluid. Measurement of the depth of foxholes and their distance from the bomb craters suggested that a hole rendering the maximum protection from blast should be about 4 feet deep. Men in shallow foxholes have been killed outright, while others in the same radius protected by holes 4 to 5 feet deep escaped injury. A hole much deeper than this involves the risk of suffocation from collapse.

Canadian Journal of Public Health, Toronto

36:131-174 (April) 1945

Manitoba's Health Proposals. F. W. Jackson.—p. 131.
Bacteriologic Observations on Diphtheria in Halifax. E. T. Byone and Dorothy E. Helmer.—p. 135.
Acute Methyl Alcohol Poisoning: Observations in Some 30 Cases. A. Branch and D. J. Tonning.—p. 147.
Dietary Survey in Farm Households at Ile Perrot, Quebec. F. M. Webster and Margaret S. McCready.—p. 152.
*Second Attack of Poliomyelitis After Thirteen Years. J. Wyllie. —p. 156.
Studies in Pullorum Disease: III. Serologic Differences in Strains of Salmonella Pullorum. R. Gwatkin and E. W. Bond.—p. 160.

Second Attack of Poliomyelitis.—A woman at the age of 32, in October 1942, developed a second attack of poliomyelitis, having had a first attack thirteen years previously at the age of 18. The first attack, which had developed after intimate contact with a sister who had a paralytic attack of poliomyelitis, had left the patient with wasting and flabbiness of the calf muscles of the right leg but with little loss of function. The patient walked with a slight limp. During the second attack, examination revealed a partial paralysis of both legs and weakness of the lumbar muscles. Wyllie reports that treatment with the Kenny packs was begun on the day of admission and continued daily for twenty-five days. On her discharge from the hospital there was some loss of power in the extensor muscles of the right thigh and loss of power in the left thigh muscles but improvement in the muscles of the lumbar region.

Delaware State Medical Journal, Wilmington

17:37-58 (March) 1945

Penicillin Therapy. H. F. Flippin.—p. 37.
Treatment of Low Back Strain. P. N. Jepson.—p. 42.
Coincidence of Affective Disorder and Circulatory Encephalopathy. G. J. Gordon.—p. 46.

Georgia Medical Association Journal, Atlanta

34:47-66 (March) 1945

Choice and Proper Use of Intravenous Fluids. T. Harrold.—p. 47.
Acacia Treatment of Nephrotic Edema. L. L. Whitley.—p. 51.
American Medicine Tomorrow. MacF. Cahal.—p. 53.

Indiana State Medical Assn. Journal, Indianapolis

38:121-148 (April) 1945

Treatment of Rheumatic Fever. N. C. Gilbert.—p. 121.
Significance of Ocular Fundus Changes in Hypertension. M. Mann and R. D. Taylor.—p. 125.
Emotional Hypertension: Study of Group of High School Boys. D. L. Urschel.—p. 128.

Kansas Medical Society Journal, Topeka

46:73-108 (March) 1945

Renal Cyst, Solitary. J. W. Martin.—p. 73.
Are Doctors People? R. I. Lee.—p. 76.

Michigan State Medical Society Journal, Lansing

44:209-312 (March) 1945

Peripheral Nerve Injuries. F. H. Mayfield.—p. 269.
Treatment of Thyrotoxicosis with Thiouracil. W. S. Reveno.—p. 276.
Management of Common Cold. A. W. Proetz.—p. 279.

44:313-424 (April) 1945

Will Free Enterprise Survive in Medicine? What the Profession Must Do to Obviate Government Control. J. F. Hunt.—p. 363.
American Medicine in Transition. E. F. Stegen.—p. 368.
Council on Medical Service and Public Relations: A. M. A. Work of the Washington Office. J. S. Lawrence.—p. 372.
Vocational Rehabilitation Program of Federal Government. E. F. Sladek.—p. 373.
Effect of Estrogens on Bone Healing. P. J. Connolly.—p. 377.
Tropical Diseases in America After the War. H. A. Lichtwardt.—p. 382.

Military Surgeon, Washington, D. C.

96:293-376 (April) 1945. **Partial Index**

New Technical Procedure in Fabrication of External Prosthetic Appliances. V. H. Dietz.—p. 293.
Medical Pioneers in the Peruvian Amazon. E. A. Westphal.—p. 303.
Laboratory Examination of Milk and Dairy Products as Conducted by Army Medical Department. R. Randall.—p. 308.
Sanitary Engineering Activities of United States Public Health Service. H. N. Old.—p. 316.
Penicillin in Military Surgery. J. S. Jeffrey.—p. 320.
British Medical Research in Aviation. A. Walbank.—p. 322.
Ruptured Peptic Ulcer Among U. S. Troops in Panama: Report of 10 Cases. W. B. Harrell and R. O. Wilson.—p. 336.
Nutrition in the Army. A. J. Dyer.—p. 342.
Sanitation in United States Navy. J. C. Geyer.—p. 344.
Löffler's Syndrome—Eosinophilic Pneumonia: Case Report. S. Scherlis.—p. 349.
Labial Sunburn in the Tropics. H. Greenfield.—p. 355.
Preparation of Plaster of Paris Bandages. H. Andre.—p. 356.

Missouri State Medical Assn. Journal, St. Louis

42:209-256 (April) 1945

What the General Practitioner Should Know About Leprosy. N. Tobias.—p. 209.
Operative Management of Ingrown Toenail. C. J. Heifetz.—p. 213.

New England Journal of Medicine, Boston

232:301-334 (March 15) 1945

Early Diagnosis of Diseases of Chest. N. J. Wilson.—p. 301.
Challenges to Medicine. V. Johnson.—p. 310.
Insect Vectors of Disease. V. A. Getting.—p. 315.

232:335-364 (March 22) 1945

Treatment of Ureters Injured During Gynecologic Operations. F. M. Ingersoll and J. V. Meigs.—p. 335.
Time Factor in Development of Complications of Gallstones. C. Bearse.—p. 338.
Low Back Pain as Presenting Symptom of Malignant Breast Tumors. T. D. Cohn and H. Cohn.—p. 342.
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232:365-388 (March 29) 1945

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Dermatitis Exfoliativa Following Arsphenamine Therapy: Observations on 50 Cases. M. J. Costello and S. Landy.—p. 369.
Insect Vectors of Disease. V. A. Getting.—p. 373.

232:389-414 (April 5) 1945

*Papaverine in Treatment of Coronary Artery Disease. W. Gray, J. E. F. Riseman and S. Stearns.—p. 389.
Plethora of Intracranial Venous Circulation in Case of Polycythemia: Pathologic Physiology and Diagnostic Considerations. J. Loman and W. Dameshek.—p. 394.
Psychosomatic Interrelations in General Medicine. Gertrude F. Frisbie.—p. 398.
Treatment of Infections with Penicillin. D. G. Anderson.—p. 400.

Papaverine in Disease of Coronary Arteries.—Gray and his associates present the results of objective studies on the use of papaverine in the treatment of 13 patients with angina pectoris who made weekly visits to the angina clinic of the Beth Israel Hospital. Papaverine hydrochloride appears to have a definite but limited and temporary vasodilator action in patients with coronary artery disease. The administration of this drug intravenously enabled half the patients with angina pectoris to do more work than was possible otherwise and decreased the electrocardiographic changes following exercise. This effect reached its maximum in five to fifteen minutes after injection and was negligible after about sixty minutes. This therapy is of little value in the clinical treatment of patients with angina pectoris. The oral administration of papaverine hydrochloride in doses of 33, 100 or 200 mg. to ambulatory patients did not improve their ability to exercise and does not appear to be of practical value in the treatment of angina pectoris. Studies on a small group of patients suggest that the administration of papaverine hydrochloride intravenously in doses of 65 or 100 mg. is of considerable value in treating the pain of coronary occlusion or coronary failure.

232:415-438 (April 12) 1945

*Trench Foot and Immersion Foot. J. C. White and W. B. Scoville.—p. 415.
Treatment of Infections with Penicillin. D. G. Anderson.—p. 423.

232:439-462 (April 19) 1945

Current Trends in Biologic Products. E. S. Robinson.—p. 439.
Engineers and Engineering in Massachusetts State Board of Health. G. M. Fair.—p. 443.
Clinical Importance of Rh Blood Type. L. K. Diamond.—p. 447.

Trench Foot and Immersion Foot.—White and Scoville state that trench foot and immersion foot are similar clinical entities that differ from frostbite in the type of exposure and the reaction of the tissues and their method of recovery. Three stages are described: the initial response to cold, short of actual freezing of the tissue cells, the early period of recovery, characterized by painful hyperemia, and the residual effects of fibrosis. The initial treatment is similar to that for burns but should include cooling to reduce the oxygen demands of the skin to a level compatible with the flow of blood through damaged subcutaneous vessels. Late treatment consists in conservative minimal amputations, exercises and physical therapy to decrease tissue fibrosis and joint stiffness and sympathectomy in selected cases with residual circulatory insufficiency. Gangrene of the toes and distal portions of the feet constitutes a serious problem in trench foot but is rare in immersion foot, in which the lower extremities are less liable to trauma and infection. Prolonged partial disability is frequent in both conditions. Improvement in protective clothing, widespread instruction in foot care and first aid and a critical evaluation of the response of the fibrosed tissues to sympathectomy are in order.

New Jersey Medical Society Journal, Trenton

42:75-104 (March) 1945

Role of Vitamins in Physiology of Vision. W. H. Hahn.—p. 81.
Simplified Local Treatment of Sinusitis with Sodium Sulfathiazole, with Special Reference to Ethmoids. E. C. Kern.—p. 89.

New York State Journal of Medicine, New York

45:449-560 (March 1) 1945

Changes Which Have Resulted from Use of Sulfonamide Therapy in X-Ray Findings in Mastoiditis. W. R. Cashion.—p. 493.
Sulfonamides in Management of Osteomyelitis. J. M. Flynn.—p. 493.
Filariasis. D. L. Augustine.—p. 495.
Review of Recent Findings in Filariasis. D. R. A. Wharton.—p. 500.
Medical Aspects of Recalcitrant and Complicated Ulcer. Sara M. Jordan.—p. 505.
Role of Quinine in Colds, Influenza and Virus Pneumonia. H. M. Feinblatt.—p. 509.
Mycosis Fungoides: Two Unusual Types, One Presenting Leonine Facies, the Other Parapsoriasis (?) in Patches for Thirty Years. E. W. Abramowitz and B. Kanee.—p. 512.

45:561-672 (March 15) 1945

Anomalies of Speech Mechanism and Associated Voice and Speech Disorders. J. S. Greene.—p. 605.
Hypoprothrombinemia: Effect of Oral and Parenteral Therapy with Synthetic Vitamin K (Synkayvite). N. H. LeTourneau.—p. 609.
Penicillin—Rapidity of Its Effect in Treatment of Gonorrhea. V. M. Dunfield and A. Mandel.—p. 614.
Multiple Sclerosis Complicating Pregnancy. C. H. Peckham.—p. 618.
Differential Diagnosis of Early Lesions of Venereal Diseases. B. A. Kornblith.—p. 623.

Oklahoma State Medical Assn. Jour., Oklahoma City

38:89-146 (March) 1945

Carcinoma of Rectum. N. W. Woodward.—p. 89.
Otitis Media. O. A. Watson.—p. 93.
Such Is Life. L. J. Moorman.—p. 97.
United States Medicine in Transition. L. J. Moorman.—p. 98.

38:147-188 (April) 1945

Management of Urinary Tract Stones. A. R. Sugg.—p. 147.
Severe Head Injuries. H. L. Puckett.—p. 150.
Para Basedowian Syndromes. L. S. McAlister.—p. 153.

Physiological Reviews, Baltimore

25:203-376 (April) 1945

Adrenal Gonad Relationship. A. S. Parkes.—p. 203.
Phlorhizin Glucosuria. F. W. McKee and W. B. Hawkins.—p. 255.
Physiology of Prostate Gland. C. Huggins.—p. 281.
Cerebral Concussion. D. Denny-Brown.—p. 296.
Appraisal of Nutritional Status (Nutriture) in Humans, with Especial Reference to Vitamin Deficiency Diseases. W. J. Dann and W. J. Darby.—p. 326.
Proteins of Plants. H. B. Vickery.—p. 347.

Psychosomatic Medicine, Baltimore

7:73-132 (March) 1945

Objective Personality Studies in Migraine by Means of Rorschach Method. W. D. Ross and F. L. McNaughton.—p. 73.
Rorschach Performance with Neurocirculatory Asthenia. W. D. Ross. —p. 80.
Rorschach Method and Psychosomatic Diagnosis: Personality Traits of Patients with Rheumatic Disease, Hypertensive Cardiovascular Disease, Coronary Occlusion and Fracture. Camilla Kemple.—p. 85.
Role of Autonomic Nervous System in Cutaneous Disorders. S. Rothman.—p. 90.
Experimental Study of Functions of Frontal Lobes in Man. G. K. Yacorzynski and L. Davis.—p. 97.

Radiology, Syracuse, N. Y.

44:213-318 (March) 1945

Carcinoma of Cheek, Alveolar Processes, Floor of Mouth and Palate. R. H. Beiswanger and K. W. Stenstrom.—p. 213.
Streamlining X-Ray Therapy for Wartime Service. A. Soiland. —p. 225.
Response of Retina to Direct Roentgen Beam: Method of Assessing Condition of Retina and Aid in Localizing Intraocular Foreign Bodies. E. W. Godfrey, H. P. Schenck and L. E. Silcox.—p. 229.
Traumatic Pneumocephalus. L. H. Garland and M. E. Mottram. —p. 237.
Response of Liver to Irradiation. F. Ellinger.—p. 241.
Congenital Solitary Pelvic Ectopic Kidney, with Report of Case. B. H. Nichols and J. T. Mary.—p. 255.
*High Altitude Joint Pains (Bends): Their Roentgenographic Aspects. S. F. Thomas and O. L. Williams.—p. 259.
Contribution to Treatment of Postirradiation Necrosis. J. E. Moseley. —p. 262.
Radiology vs. Monsoon: Effect of Climate on Equipment. P. J. Hodes and G. P. Keefer.—p. 266.
Depth Dose Meaurements at 400 Kilovolts. Lillian E. Jacobson.—p. 273.
New Principle in Roentgenography of Lateral Lumbar Spine. D. B. Slauson.—p. 280.
Further Studies on Relation Between Radiation Effects, Cell Viability and Induced Resistance to Malignant Growth: II. Effects of Roentgen Rays on Bagg-Jacksen Mouse Carcinoma 755 Irradiated in Vitro and in Situ. Anna Goldfeder.—p. 283.

High Altitude Joint Pains.—Thomas and Williams made an x-ray study of the affected joints in a decompression chamber at altitudes of 33,000 and 38,000 feet both in the presence and in the absence of pain. Lateral views of the knees were made with a small portable x-ray machine. Gas can be shown in the knee joint in every person, whether with or without "bends" pain, at an altitude of about 20,000 feet, increasing to a maximum in about thirty minutes at 30,000 feet. Large volumes of gas (estimated at 50 to 75 cc.) are clearly shown in one of the reproduced roentgenograms. Gas in the knee joint is not necessarily associated with pain and may be freely aspirated. It consists of nitrogen, oxygen and carbon dioxide approximately in equilibrium with the normal blood gases. It appears also in periarticular tissues in small irregular collections, in small discrete bubbles and in streaks along fascial planes and tendons. The gas is usually reabsorbed from the soft tissues and joint spaces by the time sea level is reached, although small (2 mm.) bubbles persist in a few instances for as long as five minutes after return to sea level.

South Carolina Medical Assn. Journal, Florence

41:55-84 (March) 1945

Treatment of Tetanus with Tetanus Antitoxin and Penicillin. J. M. Albergotti.—p. 55.
General Surgical Significance of Vasoconstriction. H. G. Smithy. —p. 57.
Maternal Mortality in Greenville Hospitals 1938-1942. J. D. Parker. —p. 61.

41:85-106 (April) 1945

Surgical Management of Thrombophlebitis and Phlebothrombosis of Lower Extremities. H. G. Smithy.—p. 85.
Use of Sulfonamide Ephedrine Nose Drops After Tonsillectomy. G. R. Laub.—p. 89.
Pregnancy Spacing in South Carolina from Public Health Standpoint. J. B. Nettles.—p. 89.

Southern Medical Journal, Birmingham, Ala.

38:229-292 (April) 1945

Fulminating Meningococcemia (The Waterhouse-Friderichsen Syndrome). H. R. Pratt-Thomas, W. H. Kelley and P. C. Gazes.—p. 229.
Relation of Hydrochloric Acid and Vitamin B Complex Deficiency in Certain Skin Diseases. J. R. Allison.—p. 235.
Discussion of Angiomata and Pigmented Nevi. L. Bivings.—p. 241.
Magnetic Removal of Foreign Bodies from Food and Air Passages Under Fluoroscopic Guidance. M. Equen.—p. 245.
Treatment of Fractures of Tibial Condyles. R. A. Knight.—p. 246.
Treatment of Acute Appendicitis. H. C. Fisher and J. C. Burch. —p. 255.
Care of Patient Following Prostatic Resection. H. P. McDonald.—p. 260.
Postmenopausal Vaginal Bleeding. W. Long.—p. 264.
Serious Slough and Fistulous Formation Resulting from Injection Treatment. F. B. Campbell.—p. 268.
Classification of Fungous Infections According to Form of Fungus in Tissues. R. D. Baker.—p. 272.
Larger Units of Local Health Jurisdictions Indispensable for National Health. H. Emerson.—p. 276.
Age Segments. W. D. MacNider.—p. 282.

Tennessee State Medical Assn. Journal, Nashville

38:61-90 (March) 1945

Surgical Activities of Overseas General Hospital. J. A. Kirtley Jr. and C. C. Trabau IV.—p. 68.

38:90-120 (April) 1945

Gonococcal Infections in Infancy and Childhood. A. Christie.—p. 91.
*Results of High School Tuberculosis Program in Tennessee. A. Dillon, R. S. Gass, W. W. Hubbard and E. F. Harrison.—p. 97.

High School Tuberculosis Program in Tennessee.—Dillon and his associates review the results of the tuberculin testing of 51,818 high school students and of the x-ray examination of positive reactors by the Division of Tuberculosis Control of the Tennessee Department of Public Health. Of these students 7,525, or 14.5 per cent, reacted to 0.01 mg. of old tuberculin and 371, or 0.7 per cent, were found to have significant lesions. The percentage of white students reacting was 13.3 and of colored students 28.4, more than double that of the white. The percentage of students with significant lesions was 0.6 for white and 2.2 for colored. Of the 371 students with significant lesions, 369 had lesions of the reinfection type, 189 of which were definite and 180 suggestive. One hundred and forty-eight, or 77.5 per cent, of the 191 definite lesions were minimal in extent, 41 were moderately advanced and only 2 were far advanced. Of 5,848 white students who reacted to tuberculin and received an x-ray examination 2,357, or 40.3 per cent, were found to have calcified lesions in the lungs, including those with significant lesions who also showed evidence of calcification.

Wisconsin Medical Journal, Madison

44:277-371 (March) 1945

Cancer Treatment with Radium Bearing Molds. K. Wiener.—p. 297.
Psychiatric Problems in Aged. W. Overholser.—p. 300.
Measles: Interesting Disease. F. B. Welch.—p. 305.

44:373-479 (April) 1945

Nutrition in Pregnancy. C. J. Lund.—p. 393.
What Constitutes Normalcy During Prenatal Period. H. A. Sincock. —p. 399.
Management of Toxemias of Pregnancy: Review of Recent Cases. R. D. Mussey and Elizabeth Mussey.—p. 404.
Pregnancy and Tuberculosis. F. M. F. Meixner.—p. 413.
Dangers and Sequela of Birth Injuries in Use of Anesthetics and Soporifics. H. A. Cunningham.—p. 419.
Double Pregnancy and Fibroids in Duplex Uterus: Report of Case. E. A. Riley and J. D. Leahy.—p. 421.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Journal Obst. & Gynaec. of Brit. Empire, Manchester

52:1-96 (Feb.) 1945

*Blood Pressure and Incidence of Hypertension in Nulliparous and Parous Women in Relation to Remote Prognosis of Toxemias of Pregnancy. Josephine Barnes and F. J. Browne.—p. 1.
Renal Failure in Obstetric Practice. G. S. Adam.—p. 13.
*Definition of Prematurity: Proposed Minimal Weight Standard for Viable Premature Infants. J. L. Henderson.—p. 29.
Value of Rhesus Test in Obstetrics. C. V. Harrison.—p. 36.
*Riboflavin Deficiency in Pregnancy. K. Braun, Y. M. Bromberg and A. Brzezinski.—p. 43.
"Long External Rotation" of Fetal Head. G. B. Thomas.—p. 48.
External Endometriosis and Pregnancy (Report of 2 Cases). M. B. McIlrath.—p. 52.
Some Curiosities of Mammalian Reproduction: Part 3.—Mammals That Produce Uniovular Litters. F. W. Jones.—p. 55.
Full Time Intraligamentous Ectopic Gestation. L. G. Selliah and W. C. O. Hill.—p. 71.

Blood Pressure and Hypertension in Toxemias of Pregnancy.—Barnes and Browne analyzed the blood pressure of 1,956 women. Of these 915 were nulliparous and 1,041 were parous. There were no statistically significant differences between the mean level of blood pressure in nulliparous and in parous women at any age. There was no significant difference between the percentages of nulliparous and parous women with blood pressures over 120/80 or over 140/90. The number of pregnancies had no demonstrable effect on the mean level of blood pressure in parous women. Pregnancy does not cause chronic hypertension. Pregnancy does not aggravate a tendency to hypertension, nor does chronic hypertension develop earlier in parous women. Though hypertension is a common remote sequel of toxemia of pregnancy, it is not caused by the toxemia. A tendency to hypertension often contributes to the severity of toxemia. Toxemia of pregnancy may be regarded as a temporary disorder leaving no permanent lesion. There is therefore no justification for terminating a toxemic pregnancy prematurely in order to protect the mother from chronic hypertension. There is no evidence that pregnancy permanently aggravates hypertension already existing when pregnancy starts. There is therefore no justification for terminating an early pregnancy in a patient with essential hypertension.

Minimal Weight Standard for Viable Premature Infants.—Henderson regards it as unfortunate that a minimal weight standard for viable premature infants was not adopted concurrently with the maximal weight standard of 5½ pounds (2.5 Kg.). The relation of the birth weight and the estimated period of gestation in 1,041 liveborn premature infants (twins excluded) has been investigated. The average weight of infants of twenty-eight weeks gestation, the age at which the fetus is generally presumed to become viable, appears to be between 3 and 3½ pounds (1.3-1.5 Kg.). A minimal arbitrary weight standard for premature infants of 2 pounds 12 ounces (1,250 Gm.) has been proposed for the following reasons: (*a*) The average weight of infants of twenty-eight weeks' gestation appears to be about 2¾ pounds. (*b*) The weight of 2¾ pounds avoirdupois corresponds to the weight of 1.25 Kg. (1,250 Gm.) in the metric system. This correspondence in round figures is an essential condition of an international standard. (*c*) The minimal weight of 2¾ pounds is exactly half of the maximal weight of 5½ pounds, a fact which simplifies the definition of the weight range of prematurity. The term "previable" has been proposed for the separate category of liveborn premature infants with a birth weight of less than 2¾ pounds. Only 4 of 118 previable infants survived.

Riboflavin Deficiency in Pregnancy.—Braun and his associates designate maceration and fissuring at the lips and angles of the mouth, glossitis, seborrheic accumulations of the nasolabial folds and certain ocular manifestations as evidence of riboflavin deficiency. In Palestine riboflavin deficiency is observed with some frequency in pregnant women. In a series of 900 pregnant women studied by the authors 190, or 21 per cent, presented manifestations of riboflavin deficiency. These symptoms made their appearance almost always during the last trimester of pregnancy and regressed shortly after delivery. An etiologic relationship between these symptoms and riboflavin deficiency was established by economic and dietary investigation, the low urinary excretion of riboflavin and the favorable response to treatment with riboflavin.

Chirurg, Berlin

15:697-756 (Dec. 15) 1943. **Partial Index**

Gunshot Injury of Heart with Missile Retained in the Wound. K. H. Bauer.—p. 697.
One Stage Pulmonary Lobectomy. A. Hart.—p. 701.
Composition of Anesthetic Solutions. J. Tóth.—p. 707.
Exposure of Vertebral Artery. K. E. Herlyn.—p. 713.
*Joint Excision in Gunshot Injuries. H. von Haberer.—p. 729.
Solitary Extoses. H. Sjövall.—p. 737.

Excision of Joint in Gunshot Injuries.—Haberer feels that excision of a joint is warranted by improvement in methods of joint surgery in which shortening of the extremity may be kept within certain limits. Secondary osteomyelitis may be prevented by adequate drainage, by immobilization with extension and by avoidance of too early transportation of the wounded. The great majority of joint injuries are caused by shell fragments rather than by infantry missiles, as in the first world war, and thus the danger of infection is increased. Excision should be done in cases in which infection threatens life and in which at least partial functional capacity may be preserved. Except for injuries of the hip joint, amputation is suggested for injuries of the lower extremities in which excision would have to be very extensive so that functional capacity could not be preserved. In a similar type of injuries of the upper extremities the extremity as such should be preserved by excision of the joint.

Deutsche medizinische Wochenschrift, Leipzig

69:739-768 (Oct. 29) 1943. **Partial Index**

Importance of Tuberculin Test, Immunity and Immunization in the Campaign Against Tuberculosis. H. Selter.—p. 739.
Cryptogenic Peritonitis and Scarlet Fever Epidemics. G. Stinner.—p. 742.
Diphtheria and Pseudodiphtheria Bacteria in Burns. W. Herrmann and T. Pütz.—p. 744.
*Observations on Undernourished Persons. K. Perakis and D. Bakalos.—p. 746.

Observations on Undernourished Persons.—Observations in the General State Hospital in Athens revealed four types of hunger edema. The cachectic type was characterized by emaciation and by slight swelling of the face and the extremities. Extreme weakness was the chief complaint and sudden death occurred regularly in the absence of prodromal signs or after diarrhea of short duration. Generalized dropsy was the second type; it was observed in less debilitated persons. Recovery occurred in the absence of intestinal disorders, and the prognosis was much more favorable in younger persons. The incidence of the third, the polyserositic, type was high. Prolonged ascites was observed frequently, but recovery occurred regularly although reaccumulation of fluid took place after evacuation. The serous fluid was deficient in albumin (2.25 per cent to 5.50 per cent). The presence of chyle associated with fatty globules was observed in 2 cases. Prognosis was less favorable in cases in which all the serous cavities were involved. The fourth type with localized edema of the face and of the extremities was characterized by a mild clinical course. Gastrointestinal disorders played an important part. Dilatation of the stomach was frequently present together with hypoacidity of the gastric juice. Diarrhea with ten to thirty movements daily was considered to be an unfavorable symptom. Stools containing undigested food, mucus, blood and pus were observed in the grave cases in which extensive ulceration of the mucous membrane of the colon was demonstrated at necropsy. Polyuria and excessive excretion of sodium chloride, bradycardia and hypotension were common. Capillary alterations in cachectic patients resulted in formation of a vascular nevus on the back of the hand and on the face. Frostbite caused by cold alone has not been observed in Athens heretofore but did result from the combined effect of cold and undernourishment. Nervous disorders with loss of tendon reflexes and of vesical and rectal control were frequent. Epithelial and subepithelial polymorphous keratitis were frequently

present. A protracted hyperglycemic course was revealed by the blood sugar curve. There was a pronounced increase in the diastase values of the blood serum. A balanced diet was not available, but young people recovered on a diet which consisted of 30 Gm. of olive oil, 90 Gm. of bread and 180 Gm. of legumes (lentils, peas and beans). Fifty cases of pellagra occurred, but the nonmalignant course of the disease is emphasized. No other diseases due to vitamin deficiency were observed.

69:769-798 (Nov. 12) 1943. Partial Index

Sulfonamide Therapy of Trachoma. W. Rohrschneider.—p. 769.
Renal Symptoms and Renal Changes in Acute Infectious Diseases. F. Munk.—p. 771.
*Serous Radiculoneuromyelitis. W. Ederle.—p. 773.
Observations on Typhus. Heimberger.—p. 775.

Serous Radiculoneuromyelitis.—Generalized motor paresis with paresthesia, especially in the distal parts of the extremities, are to be considered a uniform neuritic symptom of a group of diseases. Secondary postdiphtheritic polyneuritis is a typical representative of this group, but the same clinical course may be observed after localized pyogenous infection or after gastrointestinal disorders. Serous inflammation of the nerve roots, the spinal cord and the peripheral nerves was the basis of 23 cases reported by Ederle. The collective term "serous radiculoneuromyelitis" is suggested for this group of cases, which presented an increase in the protein in the cerebrospinal fluid without corresponding increase in cells (Guillain-Barré type). There was considerable edema about the spinal cord, particularly of the meninges and the spinal ganglions. Only 1 of the author's patients died; 22 recovered within two to three months. Malarial therapy is contraindicated because of myocardial involvement demonstrated by electrocardiograms in half of the cases. Treatment consisted in rest in bed while paralysis was in progress. Exercises and electrotherapy were instituted during the quiescent stage. Intravenous injections daily of 100 mg. of crystalline vitamin B_1 hydrochloride and subcutaneous injections of 1 ampule of acetylcholine were given.

Münchener medizinische Wochenschrift, Munich

90:705-734 (Dec. 17) 1943. Partial Index

Causalgia Complaints After Gunshot Injuries. H. Moser.—p. 705.
Ophthalmologic Examination for Prescription of Glasses to Soldiers. R. Klar.—p. 707.
Progress of Virus Research. W. Schmidt-Lange.—p. 709.
Simultaneous Occurrence of Several Congenital Clefts of Face and Jaws in Association with Other Deformities of Body. J. Gerke.—p. 712.
*Therapy of Severe Diphtheria. O. Hess.—p. 716.
Complications and Intricacies in Treatment of Pleural Empyema. K. Vossschulte.—p. 719.
Dangerousness of Intestinal Worms. F. Hamburger.—p. 722.
Therapy of Causalgia. A. Scholz.—p. 723.
Hysterosalpingography and Methylene Blue Test. H. Wirths.—p. 723.

Therapy of Diphtheria.—Hess reports results of treatment of diphtheria with serum and homeopathic drugs. Of 1,045 patients with diphtheria who were treated only with serum during the period from 1925 to 1942 71 (6.4 per cent) died. From Dec. 1, 1941 to Nov. 30, 1942 318 of 503 patients with diphtheria were treated only with serum, while 185 were given serum and homeopathic drugs; 12 (3.7 per cent) of the patients treated with serum died; 20 (10.8 per cent) of the patients given the combined treatment died. There were more toxic cases among those treated with serum and homeopathic drugs, but the total mortality rate of the 503 patients was 6.3 per cent, almost the same as the mortality rate of 6.4 per cent of the 1,045 patients treated only with serum. The good results claimed by the homeopaths from combined therapy were not proved. The administration of homeopathic drugs in addition to serum is ineffective in toxic cases of diphtheria as well as in uncomplicated cases in which serum therapy was instituted too late or in insufficient doses. Early administration of serum (at least 500 immunizing units per kilogram of body weight) intravenously (in fractional doses twice a day) and continued intramuscularly until the false membrane disappears is highly recommended. Shock from intravenous injections of serum and blood transfusions, or rise of temperature and chill produces changes in the organism which may have a good effect on the course of diphtheria. An abscess may be produced by subcutaneous injection of turpentine in addition to intensive serum therapy to divert the defense power of the organism to a different localization and to relieve the heart in toxic cases. Recovery resulted from this combined treatment in 12 of 13 cases and only 1 case proved fatal. The patients were between the ages of 2½ and 57 years.

Acta Medica Scandinavica, Stockholm

116:231-408 (Feb. 17) 1944. Partial Index

New Cytologic Method of Examination. G. Wihman.—p. 231.
Atypical Amyloidosis, with Particular Consideration of Heart. P. Soisalo and V. Ritama.—p. 260.
*Experimental Studies on Significance of Various Regions of Stomach to Anti-Pernicious Anemia Principle Content of Liver (in Swine): II. Counter-Effect of Nicotinic Acid on Disappearance of Anti-Pernicious Anemia Principle in Liver Following Resection of Fundus of Stomach. S. Petri, O. Bang, W. Kiaer and A. K. Nielsen.—p. 273.
Monosymptomatic, Isolated Riboflavin Deficiency (Ariboflavinosis) in Human Subject. P. J. Wising.—p. 288.
Rheumatic Mesarteriitis Pulmonalis. P. Brummer.—p. 294.
Treatment of Undulant Fever with Sulfapyridine. S. G. Sjöberg.—p. 304.
*Ulcerative Colitis After X-Ray Treatment for Cancer of Uterus. J. Engelbreth-Holm.—p. 308.
Course of Diabetes Mellitus During Old Age: Report of 25 Cases of Spontaneous Recovery from Diabetes Mellitus in Aged Persons. V. Schmidt.—p. 340.

Gastric Regions and Anti-Pernicious Anemia Principle of Liver.—To determine where and how the anti-pernicious anemia principle is formed, Petri and his associates performed resections of various parts of the stomach on hogs. Previous investigations revealed that total resection of the fundus leads to complete disappearance of the anti-pernicious anemia principle of the liver. However, nicotinic acid administration subsequent to total resection of the fundus compensates this loss of the active principle. This compensation depends on the presence of the cardia and on parenteral administration of nicotinic acid.

Ulcerative Colitis After X-Ray Treatment of Uterine Cancer.—Engelbreth-Holm reports the histories of 4 patients in whom radium and roentgen treatment of cervical carcinoma was followed by severe colitis with purulent diarrhea and fever. The disease took a rapid course, and all 4 patients died after from nine to thirty days.

Acta Psychiatrica et Neurologica, Copenhagen

18:377-500 (No. 5) 1943

Electromyogram of Atrophic Muscles in Cases of Intramedullary Disorders. F. Buchthal and S. Clemmesen.—p. 377.
Clinical Application of Electroencephalography, with Description of New Electroencephalograph. F. Buchthal and E. Kaiser.—p. 389.
Myositis Fibrosa Progressiva vel Generalisata. M. Ellermann.—p. 411.
Reaction of Blood in Epilepsy. A. Faurbye.—p. 419.
Case of Acute Encephalomyelitis of Neuroptic Myelitis Type. T. Fog.—p. 439.
Narcolepsy: II. Studies on Diurnal Variations in Skin Temperatures in the Narcoleptic. G. Magnussen.—p. 457.
*Cerebral Disturbances in Angioneurotic Edema. Estrid Ottesen.—p. 487.

Cerebral Disturbances in Angioneurotic Edema.—Ottesen reports a case of angioneurotic edema associated with convulsions in a man aged 41. The family history was negative as to epilepsy and other nervous and mental disorders and for allergic disease. At the age of 10 the patient suffered from urticaria and at 17 he fell from a height of about 35 feet and injured the left side of his head. The injury produced only mild symptoms and no subsequent discomfort. Six weeks prior to his admission to the hospital he had suffered from a sudden generalized attack of tonic-clonic convulsions accompanied by unconsciousness. He subsequently suffered from three similar attacks, one of which affected only the left side. During the patient's stay in the hospital there was noted the typical angioneurotic edema of the lower lip, the tongue, the right cheek, the right foot, the prepuce and the dorsum of the penis. Diagnosis of angioneurotic encephalopathy was made. Literature records 7 cases of angioneurotic edema associated with convulsions. In 22 additional cases from the literature a number of other symptoms of neurologic interest were described, such as transitory exophthalmos, oculomotor paresis, aphasia, hemipareses of apoplectiform character, symptoms of increased intracranial pressure and choked disk. The etiology of angioneurotic edema is associated with disturbances of the vegetative nervous system, allergy and heredity. The prognosis is good in the nonhereditary cases. The possibility of angioneurotic edema should be kept in mind when one is faced with an obscure morbid condition associated with cerebral manifestations.

Book Notices

Operations of General Surgery. By Thomas G. Orr, M. D., Professor of Surgery, University of Kansas School of Medicine, Kansas City, Kansas. Cloth. Price, $10. Pp. 723, with 570 illustrations. Philadelphia & London: W. B. Saunders Company, 1944.

A surgical generation ago a book on operative surgery was the chief preceptor of the physician who desired to expand his activities into operative therapy. This demand for didactic instruction in technical procedures was filled by many books dealing with this subject, some of which presented the surgical technic of the time in a manner complete and historically correct but without selective guidance. Since then surgery has become more specialized, based as it is on new developments, but it has also become more critical of operative procedures, as the result of the study of end results and of the application of basic medical sciences to diseases treated by operative measures. The interest of surgeons has been directed to the more general aspects of preparing patients for operation and to treating and preventing complications of the operation. This expansion of surgical interest has been of major importance to the betterment of surgical results but may have led us too far away from the technics which, while not of sole importance, must always be of a high fixed quality in any operation. Dr. Orr has rendered a real service in bringing up to date the technics of operative procedures, presenting them anew in the light of surgical advance in the past decade. The book covers, with careful selection, the technics of operations on all parts of the body except the eye, the nose and the throat. Those who specialize in the fields of neurologic, gynecologic, thoracic or genitourinary surgery may find that the presentation of the operative technics in these fields is inadequate for those who limit their endeavors to these fields, but to the surgeon who may be called on to treat the sick without benefit of consultations with specialists the presentation in these special fields will be extremely helpful. As Dr. Orr states, "students of surgery should be familiar with the standard operation of all fields of surgery."

There are twenty-one chapters arranged according to systems rather than to specialty. The first three chapters deal satisfactorily with the wound and the factors that influence healing and the details of its management. In the presentation of each system and in the discussion of the parts of these systems, the subject is approached by a general consideration of the problem, followed by a summation of a philosophical nature that clarifies and enunciates the objectives. In all situations where anatomic facts are pertinent to operative procedures, a description of the anatomy involved is given. Before each description of operative technic there is given with detail the dangers encountered during this operation and the safeguards that should be observed to minimize them.

The clinical indications for each operation are given simply and clearly. The steps of the operation are given in the same manner, with critical comments from the personal experience of the author, with pertinent additions from surgical literature that combine to give the presentation a human and very readable quality. Following each chapter is a list of references to surgical work on the topic under discussion. The illustrations are profuse, clear and instructive. Many are original and others are selected from the literature, and all have been reproduced in such size and detail that they supplement well and amplify the written text. The artists are to be complimented on their contributions to the usefulness of the book. The minor parts of technics such as dressings and the management of drains and sutures are given in detail that is of help to even the neophytes in surgery. The book is of an agreeable and satisfying format, holdable and readable. It will prove a boon to the young surgeon for whom it was actually written, to be used during his training period and immediately afterward, but it should be in the working library of every general surgeon, especially if he works without benefit of numerous consultants in surgical specialties. To all others who are interested in the technics of present day surgery the book is heartily recommended. The teachers of surgery owe to Dr. Orr a debt of gratitude for his compilation of operative technics streamlined to the practice of the present day.

Anatomy as a Basis for Medical and Dental Practice. By Donald Mainland, M.B., Ch.B., D.Sc., Professor of Anatomy, Dalhousie University, Halifax, N. S. Cloth. Price, $7.50. Pp. 863, with 61 illustrations. New York & London: Paul B. Hoeber, Inc., 1945.

The amount of time allotted to gross anatomy in the curriculum of medical schools has been reduced, because other preclinical sciences have required increased time owing to their great development during the twentieth century. Some teachers in these other sciences have felt that the time given to dissection was wasted; but most faculties feel that "menders of the human body" should trouble to know that body thoroughly, and state laws require dissection. But the anatomists have revised their courses, reducing the content considerably, though sometimes wondering if the facts of biochemistry, newly introduced, are really more important than those of anatomy which they have displaced.

Further, the anatomists have produced new books as substitutes for the old textbooks and dissecting manuals. Mainland's is one of the best of these new books. It is called simply "Anatomy," being neither a textbook (storehouse) nor a dissecting guide. It is a general educational guide for the student starting the study of human anatomy and so starting the study of medicine or dentistry. The first twenty-eight pages prepare his mind for the study of medicine, the next forty-one for the study of anatomy and the next eighty-six for dissection by a systematic consideration of the tissues of the body—of their general structure, of what they do and something of how they do it. Such an introduction to dissection has been practiced by W. E. L. G. Clark of Oxford and by many American teachers of anatomy. Five hundred and ninety-two pages are devoted to regional study of the body, and after that follow appendixes and references—ninety pages, and index—twenty-four pages.

Features of the book which seem open to criticism are the amount of attention given to statistics and statistical methods, necessary for physical anthropologists but not for medical students, and the unvarying requirement that findings in the cadaver be transferred to and marked on living bodies at once. Living models would be all dirtied up in the dissecting rooms. Instead, thorough students will doubtless make groups and study anatomy on one another at home. Some students will question both the accuracy and the logic of some answers given by the author to his own questions; but at least such students will think.

Features especially commendable are the references to recent anatomic literature, which are the best in any handbook on gross anatomy, and the questions (three hundred and thirty-seven of them) asked throughout the book and answered in one of the appendixes at the back. Good teachers make students animated interrogation points. Many facts impossible to remember are conveniently tabulated at the back, e. g. age of appearance and of fusion of ossification centers.

Each part of the book is excellent. The plan and treatment are largely original and are evidently the result of long experience by a capable and conscientious teacher. The student who works conscientiously under its guidance will become a good doctor and a good thinker. He will spend a lot of work on anatomy—every good student always will; he will not have found this book a "shorter" anatomy. Indeed, he will probably have acquired in addition to this book one of the old textbooks (for frequent reference) and an atlas (as a constant companion) and, unless the teacher prefers to give directions orally, he will also have a dissecting guide. Nevertheless, this book is one of the best guides ever written for learning the practical anatomy useful to practitioners.

Pre-Excitation, a Cardiac Abnormality: Patho-Physiological, Patho-Anatomical and Clinical Studies of an Excitatory Spread Phenomenon Bearing upon the Problem of the WPW (Wolff, Parkinson and White) Electrocardiogram and Paroxysmal Tachycardia. By Richard F. Öhnell. Acta medica Scandinavica, Supplement No. 152. Translated by Ulla Schött. Paper. Pp. 167, with 29 illustrations. Stockholm, 1944.

This monograph, a supplement to *Acta medica Scandinavica*, is an excellent translation, by Ulla Schött, of the author's views regarding the WPW syndrome. The report of 70 carefully studied cases with correlated discussion of 250 from the literature reveals his comprehensive knowledge. Since 1930 forty theories have been advanced, fifteen of these since 1940. The term preexcitation indicates an additional excitatory spread in the ventricles of the heart, coupled to the auricular excitation

wave; the phenomenon being represented graphically by a short PR interval and a prolonged aberrant QRS complex. The author reports a case with muscle bundle connection of the left auricle and ventricle. A right sided auriculoventricular junction has been reported. Hence such an anomaly could result from the excitation wave being transmitted via both the normal and accessory conduction pathways. He gives reasons for assuming an acquired as well as a congenital etiology in these cases. He reports observations suggesting the possibility of a hereditary factor. He thinks that mechanical stimulation of an excitable ventricular focus by auricular systole or vice versa seems likely. This monograph presents the latest and most complete information.

The Treatment of Peptic Ulcer Based upon Ten Years' Experience at the New York Hospital. By George J. Heuer, M.D., Professor of Surgery of Cornell University Medical College and Surgeon-in-Chief of the New York Hospital. Assisted by Cranston Holman, M.D., Assistant Professor of Clinical Surgery, Cornell University Medical College, New York, and William A. Cooper, M.D., Assistant Professor of Clinical Surgery, Cornell University Medical College. Fabrikoid. Price, $3. Pp. 118, Philadelphia, London & Montreal: J. B. Lippincott Company, 1944.

This presents a statistical study and discussion of 1,139 case histories over a period of ten years at the New York Hospital. A critical evaluation is given the reader of results from both the medical and the surgical treatment of the disease without giving too many descriptive details of the therapy itself. The book is divided into two parts, on medical and on surgical treatment. In the medical section there is discussion of both ambulatory and hospital treatment. Considerable emphasis is placed on the question of hemorrhage and of malignancy in gastric ulcer. In addition there is some mention of an attempt to deal with the psychologic problems involved. The surgical section is of course chiefly concerned with the results obtained with gastroenterostomy as compared with gastric resection. No attempt is made to influence the reader as to the method of choice, but the authors do feel that in resection a moderate resection is the operation of choice. There is, of course, a chapter on surgery for perforations and an excellent chapter on the effects of operation on gastric secretion. The book closes with a survey of the literature on the subject and finally a discussion and summary of the material covered in the book. A bibliography of the literature referred to is given. The authors do not purport to offer the final answer or give a cure-all. Rather they are attempting to help clarify many controversial facts to aid one in the therapy of what is at best a difficult disease to treat. Certainly we are reminded of the fact that peptic ulcer is still a serious problem and that much remains to be done to untangle the many ramifications of the therapy of peptic ulcer.

An Introduction to Pharmacology and Therapeutics. By J. A. Gunn, M.A., M.D., D.Sc., Professor of Therapeutics and Director of the Nuffield Institute for Medical Research, University of Oxford. Seventh edition. Fabrikoid. Price, $2.25. Pp. 268. New York & London: Oxford University Press, 1944.

The first edition of this delightfully written pocket size synopsis of pharmacology appeared in 1929. Its popularity both in the British Isles and in this country has given impetus to frequent revisions. The present edition, like the previous ones, summarizes in an authoritative manner the principal actions and uses of the more important drugs. The discussions in many instances are briefer than those found in the comparable American publication Useful Drugs. The emphasis in the book has been placed on drugs official in the British Pharmacopeia or the United States Pharmacopeia. Unfortunately, although the book was actually revised in 1943, many of the newer and widely used useful drugs are omitted. Desoxyephedrine ("Pervitin," "Methedrine"), which was first used in Europe, is not mentioned; quaternary ammonium antiseptics are omitted; the discussion of the sulfonamides is extremely brief and the newer ones, such as succinylsulfathiazole and sulfamerazine, are not mentioned; no discussion of the antibiotics is to be found, although the omission of penicillin is not surprising since the published clinical information on this drug was scant at the time this edition was prepared. The book's chief usefulness is as a readable summary of conservative pharmacology and as such will prove useful both to the student and to the practicing physician.

The Reticulo-Endothelial System in Sulfonamide Activity. By Frank Thomas Maher, Ph.D., Assistant Professor of Pharmacognosy and Pharmacy. Contribution from the Department of Pharmacology, Materia Medica and Therapeutics in the College of Medicine. Illinois Monographs in the Medical Sciences, Vol. V, Nos. 1-2. Paper. Price, $2.50. Pp. 232, with 23 illustrations. Urbana: University of Illinois Press, 1944.

This interesting monograph was presented in 1941 as a dissertation for the degree of doctor of philosophy in pharmacology in the Graduate School of the University of Illinois. It is an important contribution to the role of "defense mechanisms" in chemotherapy. The "defense mechanisms" of the body against bacterial infection depend in part on the activity of the reticuloendothelial system. The many careful experiments reported in this study show that blocking the reticuloendothelial system (by thorotrast) reduces the resistance of animals to infection with Staphylococcus aureus, depresses conjugation of sulfanilamide and sulfathiazole and reduces the chemotherapeutic effectiveness of sulfathiazole in animals infected with Staphylococcus aureus. It is therefore concluded that reticuloendothelial activity is necessary to effective sulfonamide chemotherapy. The large bibliography of six hundred and twelve references refers chiefly to bacterial infections and the sulfonamides. The illustrations offer evidence of the successful blocking of the reticuloendothelial system by means of thorotrast. While the monograph exhaustively reports a large and interesting group of experiments, it affords little information of significance to the "practical" physician. However, it adds materially to the growing body of evidence showing the importance of the reticuloendothelial system in resisting infection and in contributing to the effectiveness of chemotherapeutic agents. Many workers have demonstrated the importance of the reticuloendothelial system, particularly the spleen, in relation to trypanosome infections and the chemotherapeutic effectiveness of arsenical drugs. Little information has been made available as to methods whereby the reticuloendothelial system can be stimulated to afford increasing resistance to bacterial infection. The work of Bogomolets and his Russian collaborators suggests methods that may become of "practical" interest.

Keys to the Anopheline Mosquitoes of the World With Notes on Their Identification, Distribution, Biology, and Relation to Malaria. Prepared for the Preventive Medicine Division, Office of the Surgeon General, U. S. Army. By Paul F. Russell, M.D., M.P.H., Lieut. Colonel, Medical Corps, A. U. S., Lloyd E. Rozeboom, B.S., Sc.D., and Alan Stone, B.S., Ph.D. Paper. Pp. 152, with 10 illustrations. Philadelphia: American Entomological Society, Academy of Natural Sciences, 1943.

This excellent handbook was prepared especially for use by the Army in its education program to keep pace with the global expansion of the war. The introduction includes a brief history of the discoveries of mosquitoes as vectors of disease and comments on how Anopheles with particular habits may be related to malaria in a community. Chapter II gives a simple but effective outline on mosquito identification, which is well illustrated with appropriate drawings. The keys in the following chapters are largely borrowed from previous works. The chapters of keys are Anopheles of Canada, the United States and Northern Mexico, Anopheles of Central America, Anopheles of Europe, North Africa and the Near East, Anopheles of South and Central Africa, Anopheles of Asia, except the Philippines, southern Asia, northern Asia and the Malayan region, Anopheles of the Philippines and Anopheles of the Australian region. Following the key in each chapter the mosquitoes are listed alphabetically and notes on their identification, distribution, biology and relation to malaria are given. Another chapter summarizes the known vectors of malaria for specific localities of the world. The list of references is extensive. The index to specific and subspecific names is adequate for the volume. This practical volume will undoubtedly find wide application by those who have occasion to identify anopheline mosquitoes in any part of the world.

Voenno-meditsinskiy sbornik. I. [Compiled by] Voenno-Sanitarnaya Komissiya. [Collection of Articles on Military Medicine.] Paper. Price, 8 rubles. Pp. 160, with illustrations. Moskva & Leningrad: Izdatelstvo Akademii Nauk, SSSR, 1944.

The volume contains several papers on the effects of amphetamine on fliers, on the effect of nitrogen concentration in fliers, on a new biochemical preparation for acceleration of wound healing—an autolysate of brewers' yeast—and so on. The symposium is of the type that does not rate a review in THE JOURNAL.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

EFFECT OF SULFONAMIDES AND VITAMINS ON THE TEETH

To the Editor:—**A dentist maintains that the sulfonamide compounds, sulfanilamide in particular, has a softening effect on the teeth. A patient with pharyngitis was given sulfanilamide two years ago and the decay of some of his teeth has been attributed to the sulfonamide compounds. The dentist is now prescribing vitamins to a patient who has had a liberal mixed diet and says he will have to replace all fillings because of the damage done to the teeth by the use of the sulfonamide compounds. What is the best opinion concerning the use of sulfonamide compounds for pharyngitis and what effect if any can sulfonamide compounds have on teeth? In what manner can vitamins repair brittle or soft teeth?**

S. A. Kleger, M.D., Astoria, Ore.

ANSWER.—In a large group of patients given sulfanilamide for various reasons, no effects on the teeth have been observed or reported. There is no mechanism known whereby sulfonamide compounds could affect the structure of the teeth or modify the process of dental decay.

The description brittle or soft teeth is indefinite. Imperfect calcification of the teeth can occur only during their developmental period. Decalcification of the enamel, on the other hand, results only from the local action of acids on the surface of the tooth. Perhaps reference is made to dental caries: the relation of sulfanilamide to this condition is not known.

The use of vitamins to prevent or treat dental caries has been proved to be ineffective in a number of investigations. The enamel of the tooth, which is the first dental structure attacked by decay, is avascular and acellular and does not have power of regeneration or repair. Removal of the decay and replacement of the lost structure by proper restoration is the only effective treatment.

HAZARDS OF EXPLOSIVE ANESTHESIA

To the Editor:—**What precautions should be taken in the use of explosive anesthetics? Is the use of cyclopropane and ethylene without intercouplers or insulation safe? What are the minimum safeguards? Is cyclopropane as safe as nitrous oxide, oxygen and ether, as some authors state? I would like to install the legitimate requirements on two new Heidbrinks and a Foregger machine.**

V. M. McCartney, M.D., Warren, Ohio.

ANSWER.—In order to produce a fire or explosion in the operating room, two conditions are necessary: there must be an ignitible mixture of vapors or gases, and such a mixture must come in contact with a source of heat sufficient to ignite it. A mixture to be ignitible must contain the ignitible substance (usually a hydrocarbon compound such as alcohol, ether, ethylene or cyclopropane) and an adequate amount of available oxygen. Sources of heat may be furnished by open flames such as gas burners or alcohol lamps, by cauteries, by partially broken connections and other imperfections of electric surgical instruments and lights and by static sparks. It should be remembered that gases compressed in containers under high pressure may explode without the aid of ignition when the pressure is higher than the strength of the container. Absolute protection would forbid the presence of any ignitible mixture, a requirement as practical as it would be to forbid the use of illuminating gas in kitchens or of gasoline in automobiles. Intelligent application of precautions which are obvious can reduce the hazard in operating rooms to a point no more dangerous than is the use of a gas range, a water heater or an automobile. Any added hazard in the operating room as compared with the kitchen has to do with the presence of superabundant oxygen to promote combustion. Nitrous oxide supports combustion almost as well as does oxygen.

Certain of the obvious precautions may be listed categorically. 1. Open flames (gas, alcohol) and glowing fire (smokers) are not permissible. 2. All electric equipment (lighting, cauteries, electrosurgical) should be inspected frequently and kept in perfect condition. 3. Containers and apparatus for the control of volatile substances and compressed gases, including oxygen and nitrous oxide, should be inspected frequently and kept in proper leakless operating condition. 4. Oxygen and nitrous oxide or their mixtures must be looked on as superabundant sources of support for combustion.

More specific "rules for the anesthetist" are often laid down, but these cannot replace an ever present awareness of the possibilities and recognition of the laws of physics. Such rules are: 1. Use only noninflammable agents when the cautery or other sources of ignition must be applied near the face or in the air passages. Be sure that infinitesimal quantities of inflammable agents are not inadvertently mixed with oxygen and nitrous oxide under such circumstances. 2. If the anesthetist is capable of using a closed technic (carbon dioxide absorption) without leaks, the cautery, electric knives and so on may be used on distant parts of the body when inflammable agents are employed. 3. Precautions regarding hazard from static sparks have been controversial. Engineers answer the question academically by advising complete "grounding" of all objects in contact with or in the vicinity of the patient. When they become familiar with operating room conditions, however, they realize that complete grounding is impossible to achieve in the operating room. Humid atmosphere, radiated atmosphere, intercouplers (special metal connectors between all objects) and other safeguards have been suggested. Experience to date is not convincing that any of these affords a more practical safeguard from static sparks than if the anesthetist makes it a rule to place his hands in contact with the patient, apparatus and table in preparing to anesthetize and maintains contact between all objects within the area contaminated by ignitible mixtures throughout the administration.

References:

1. Conference Committee on Operating Room Hazards: Combustible Anesthetics in Hospital Operating Rooms, Boston, National Fire Protection Association, 1944.
2. Fundamentals of Anesthesia, ed. 2, Chicago, American Medical Association Press, 1944, p. 204.
3. Explosion Jitters, editorial, *Surgery* **10:** 661 (Oct.) 1941.
4. Slocum, H. C., and Finvold, R.: Ionization of the Air: A Method for the Dispersion of Charges of Static Electricity, *Anesthesiology* **5:** 33 (Jan.) 1944.

DEVELOPMENT OF RED BLOOD CELLS

To the Editor:—**What is the normal percentage of normoblasts or erythroblasts, if any, present in the cord blood of a living or recently dead 4½ to 7 months fetus? Is a normoblast the same as an erythroblast? If not, in what respect do they look different under the microscope?**

Charles J. Marshall, M.D., Binghamton, N. Y.

ANSWER.—According to the great majority of investigators there are two generations of red blood cells in all vertebrates. The first of these is called the primitive or transitory or temporary generation in which the final product is a spherical, nucleated, hemoglobin containing cell—the first oxygen carrier of the embryo. In the mammals it develops almost exclusively in the yolk sac. The permanent or definitive red blood cell generation in the embryo develops in several successive sites beginning with the liver and ending with the bone marrow. Its final product is the non-nucleated erythrocyte, which is identical in all respects with the erythrocyte or erythroplastid of the postnatal and adult mammal. According to some investigators all precursors of normal erythrocytes of both generations should be called erythroblasts and the specific stage of blood cell formation should be indicated by a modifying adjective such as primitive basophile erythroblast or definitive basophile erythroblast, and similarly for polychromatic and orthochromatic erythroblasts of both generations. According to this terminology the orthochromatic erythroblast is also called a normoblast. This is a relatively small cell in the definitive generation with an eosin staining cytoplasm of the same color as that of the mature non-nucleated erythrocyte. There are a few authorities, however, who use the term normoblast for all of the precursors of the erythrocytes of the definitive generation. These authorities thus speak of basophile normoblasts, polychromatic normoblasts and normoblasts.

The greatest difference in appearance between the nucleated erythrocytes of the primitive and definitive generations is in the size of the cells. The primitive erythrocytes are large and according to some investigators they are comparable in appearance with the megaloblasts of pernicious anemia.

In early embryos, all erythrocytes are nucleated cells of the primitive generation. The number of nucleated erythrocytes in the embryonic blood of man diminishes progressively during the remainder of gestation. In the latter part of fetal life all of the nucleated erythrocytes are of the definitive generation. The only figures available for the stages indicated in the question are as follows: A 362 Gm. embryo with a menstrual history of 17 weeks had counts of 12,000 nucleated erythrocytes, total red blood cells of 3½ million and 4,000 white blood cells in the cord blood. A fetus of 440 Gm. with a menstrual history of 24 weeks had counts of 3,500 nucleated erythrocytes, total red blood cell count of 2,940,000 and 3,500 white blood corpuscles.

The statement is frequently made that cord blood at birth shows an upper normal limit of 5 to 10 nucleated erythrocytes for every hundred white blood corpuscles.

Reference:

Jones, O. P.: Cytology of Pathologic Marrow Cells with Special Reference to Bone Marrow Biopsies, Handbook of Hematology, New York, Paul B. Hoeber, Inc., 1938, p. 2045.

EFFLUVIUM SEMINIS AND STERILITY

To the Editor:—**A patient tells me that his wife never retains the semen in the vagina after sexual intercourse but expels it. Immediately after intercourse she goes to the bath room and in a short time most if not all of the semen drips down and out of the vagina into the toilet. Could this be a cause of sterility or do you think enough semen remains in the vagina to cause fertilization? They have been married for three years and have no children. What treatment is recommended for this condition?**

Captain, M. C., A. U. S.

ANSWER.—Effluvium seminis after intercourse occurs in about 80 per cent of all married women, the fertile as well as the involuntarily childless. This fact by itself suggests that such an outflow is not necessarily associated with impaired fertility. Under normal anatomic conditions some spermatozoa arrive in the endocervix, if not at the moment of ejaculation, a few minutes thereafter at the latest. There is little likelihood that these will escape. The majority of the spermatozoa remain in the vagina, where they are promptly attacked by the acid vaginal moisture. Their period of survival is short, and it is not a matter of importance whether they are retained or lost.

The first procedure should be a postcoital examination. The wife should be seen within two hours after intercourse, preferably at the midpoint of her menstrual cycle, and several drops of endocervical mucus should be examined microscopically. If living spermatozoa are found, obviously effluvium of the vaginal pool has not interfered with the mechanics of conception. If, on the other hand, spermatozoa are not present in the cervix, the cause of this abnormality should be sought. The chances of cervical insemination will be increased if the wife, instead of arising and going immediately to the toilet, lies quietly for ten minutes on her back, perhaps with a pillow under her hips. Possible disorders to be investigated include premature ejaculation, hypospadias, urethral stricture in the husband and anteflexion or anteversion of the cervix. If repetition of the postcoital examination still does not show spermatozoa in the endocervix after all such conditions have been ruled out or corrected, artificial insemination may be considered.

It should not be forgotten that there are many causes of infertility other than faults in the mechanism of cervical insemination and that the average sterile mating presents a combination of several causative factors. Complete diagnostic study of both husband and wife is essential.

EFFECT OF ALTITUDE ON HEART WORK

To the Editor:—**Is the human heart called on to perform the same work at sea level as at an altitude of 8,500 feet under the same circumstances of rest, exercise and disease? Must the human heart increase its effort when climbing in a plane to high altitudes, from sea level to 8,500 feet? If this is so, would a man with heart disease be, in effect, putting his heart at rest by descending to a sea level area from a high altitude? Are dangerous consequences to be expected from a change of altitude for a person with heart disease?**

G. Araoz Fraser, M.D., Bogota, Colombia.

ANSWER.—Since the pressure of oxygen in the inspired air is decreased at higher altitudes because of the decrease of atmosphere at points much elevated above sea level, there is a definite increase in the work of the heart needed to supply an adequate amount of oxygen to the tissues. This statement is true under the same circumstances of rest, exercise and disease—even climbing in a plane from sea level to 8,500 feet increases the work of the heart. In persons with heart disease, if this is relatively slight and myocardial and coronary reserve are reasonably good, harm does not result from such an ascent; few instances of serious consequence, even in those who have heart disease, have ever been reported as a result of airplane flights.

Descent to sea level from a high altitude does afford some rest for the heart: it was calculated by Barcroft and his associates in 1922 that at an altitude of 15,000 feet the heart works about 20 per cent harder to accomplish 20 per cent less work than at sea level (Barcroft, J., and others: Observations on the Effect of High Altitude on the Physiological Process of the Human Body, Carried Out in the Peruvian Andes, Chiefly at Cerro de Pasco, *Philos. Trans. Roy. Soc.*, London, 1921-1923, Series B **211**:351-480).

MANAGEMENT OF CONVULSIONS IN THE NEWBORN

To the Editor:—**What are the relative value and suitable dosage of the following anticonvulsants for the newborn baby averaging 7 pounds (3.2 Kg.): phenobarbital sodium, chloral hydrate, 50 per cent solution of magnesium sulfate, and morphine? What are the relative value and dosage for the newborn of the following respiratory stimulants: caffeine and sodium benzoate, nikethamide (25 per cent solution of pyridine beta-carboxylic acid diethylamide), metrazol, alpha-lobelin, carboxygen? Are there any other respiratory stimulants or anticonvulsants that are more reliable?**

M.D., New York.

ANSWER.—In the management of convulsions in the newborn, anticonvulsant drugs are frequently neither necessary nor advisable. If the convulsions are due to an asphyxia, treatment should be directed primarily at relieving the cause of the asphyxia, which is often due to some mechanical obstruction. If the convulsions are due to a hypoglycemia, the use of intravenous or subcutaneous dextrose solution is a life saving measure. In those children in whom there is an increase in the intracerebral pressure as the result of intracerebral hemorrhage or edema, a lumbar puncture may stop the convulsions. In tetany of the newborn calcium salts parenterally or by stomach tube are indicated.

Anticonvulsant Drugs and Dosages

By Inhalation
- * Chloroform
- * Vinethene
- Ether

By Intravenous or Intramuscular Route
- * Barbiturates
  - Phenobarbital sodium
  - Sodium amytal
  - Pentobarbital sodium
  - Seconal sodium

  } Dosage—⅛ to ½ grain (0.008 to 0.032 Gm.) but usually ¼ grain (0.016 Gm.), 0.33 cc. of 5 per cent solution. When given intravenously, inject slowly, and when convulsions stop, give no more.
- Paraldehyde 0.75 cc. (should not be given intramuscularly).
- Magnesium sulfate 2 to 5 cc. of the 10 per cent solution intramuscularly.
- * Recommended or preferred drugs.

By Rectal Route
- * Barbiturates
  - Phenobarbital
  - Amytal
  - Pentobarbital
  - Seconal

  } ½ to ¾ grain (0.032 to 0.05 Gm.).
- * Solution of tribromoethanol 60 to 100 mg. per kilogram.
- * Evipal sodium 1.50 to 2 cc. of 10 per cent solution.
- Chloral hydrate 3 to 5 grains (0.2 to 0.32 Gm.).
- Sodium bromide 3 to 5 grains (0.2 to 0.32 Gm.).
- Ether in oil 10 cc. of 50 per cent ether in olive oil.
- * Recommended or preferred drugs.

When, however, it is found desirable to use some anticonvulsant drug, the accompanying table indicates the dosages and route of administration. Barbiturates are the drugs of choice and should be given by injection or rectally.

Although a 50 per cent solution of magnesium sulfate may be used, it is definitely not the drug of choice, since its parenteral administration may result in depression of the respiration. For the same reason morphine is contraindicated in convulsions of the newborn. The only type of convulsions of the newborn in which morphine or its related alkaloids are indicated is those occurring in children born to women who are narcotic addicts. In these children the convulsions are often a manifestation of the withdrawal of morphine and are best controlled by paregoric given in oral doses of 5 to 10 drops every fifteen minutes until the spasms subside. In very severe convulsions in the newborn it may sometimes be necessary to use a whiff of chloroform or vinethene for immediate control. These are preferable to ether because of their faster action.

The dosages for the respiratory stimulants for the newborn are as follows:

Caffeine and sodium benzoate 0.5 to 1 cc. of an ampule containing 7½ grains (0.5 Gm.) in 2 cc.

Nikethamide 0.5 to 0.75 cc. of an ampule containing 25 per cent solution in 1.5 cc.

Metrazol 0.25 to 0.5 cc. of an ampule containing 1½ grains (0.2 Gm.) in 1 cc.

Alpha lobeline 1 cc. of an ampule containing $\frac{1}{20}$ grain (0.0032 Gm.).

Camphor in oil 0.25 to 0.5 cc. of an ampule containing 3 grains (0.2 Gm.) in 1 cc.

Picrotoxin 0.25 cc. of an ampule containing $\frac{1}{20}$ grain (0.0032 Gm.) in 1 cc.

Carbon dioxide 5 per cent and oxygen 95 per cent is supplied through a nasal mask and preferably through a resuscitator.

Since there is no definite proof that any of these respiratory stimulants are responsible for the initiation of breathing in the newborn child, it would be difficult to evaluate the relative efficacy of each or of any of the numerous similar products which are on the market. It should be borne in mind that convulsions may ensue from the use of metrazol or picrotoxin in some infants.

As previously stated, the best treatment of asphyxia is that aimed at clearing the respiratory passages. The proper and judicious use of a tracheal catheter is probably of greater value than any or all of the drugs which are discussed.

"FIBERGLAS" NOT CAUSE OF PNEUMONOCONIOSIS

To the Editor:—Compartments in the service ships are being lined with mats of "Fiberglas," presumably for insulating and sound proofing purposes. Several shipworkers have had severe persisting cough, sometimes lasting for many months, which they ascribe to the "Fiberglas" dust. Some men have physical signs of bronchitis, some do not. One man who had coughed for seven months—since beginning to work with the "Fiberglas"—has no definite physical signs of silicosis, and his x-ray film is normal except for a number of Ghon shadows. Is there not an industrial hazard of silicosis? No respirators or masks are issued.

Bernhard A. Fedde, M.D., Brooklyn.

ANSWER.—Unpublished animal experiments at the Saranac Laboratory have demonstrated that "Fiberglas" is not inhalable in appreciable quantities. After exposures of three years with the maximum atmospheric concentrations that could be maintained, the lungs of guinea pigs and white rats contained practically no fiber, and no scar tissue developed. The fiber used for insulation varies from 3 to 10 microns in diameter, which is too coarse to penetrate the lungs. A specially prepared fiber, 3 microns or less in diameter, was also excluded from the lungs apparently because it carries an electrostatic charge which causes it to adhere and mat on surfaces with which it comes in contact. Annual x-ray examinations of employees manufacturing this product have revealed no signs of pulmonary reaction. While Fiberglas is irritating to the skin and upper respiratory membranes, it does not cause pneumonoconiosis.

VARIATION OF BLOOD PICTURE IN VENOUS AND CAPILLARY BLOOD

To the Editor:—Is there any difference in the determination of hemoglobin percentage and the red cell count in blood obtained from the finger tip, the ear lobe or venous blood from the cubital vein after application of a tourniquet?

Abraham A. Brauer, M.D., East Chicago, Ind.

ANSWER.—There are no differences between samples obtained from the first two sites. Differences between these and venous blood are not of great magnitude and depend more on standardized technic than on the location. Blood from the ear lobe or the finger tip is usually mixed venous and capillary blood; therefore it would be slightly less venous than that from the cubital vein, but it would still be within the range of technical variation. The best procedure would be for the technician to make simultaneous determinations from the three sites and to determine the extent to which his personal technic would introduce an error.

VAGINAL DOUCHES

To the Editor:—What is the position of the leading authorities on the douching of the vagina in girls and unmarried women for the treatment of distressing odors arising from discharges in the vagina? Is it good practice to advise both young women and little girls to douche at home?

Raymond Lublin, M.D., East Hartford, Conn.

ANSWER.—J. P. Greenhill in his chapter on vaginal douches in "Office Gynecology" (ed. 3, Chicago, Year Book Publishers, Inc., 1943) says:

"There is no unity of opinion among either physicians or women concerning the value of vaginal douches. At one extreme one finds women who take a douche every day, except during menstruation, in the belief that it is a cleansing process equivalent to brushing the teeth. At the other extreme are women who never take a douche, not even after sexual intercourse. In between are women who take douches after coitus, after the menstrual flow is over and on special occasions. Those who douche use a variety of substances in the douche water, and physicians prescribe a large number of douche preparations."

"Are douches essential, and are there any types of douche medication which may be harmful?"

"I believe that women who have a normal qualitative and quantitative vaginal secretion should not take douches at all except perhaps after intercourse and at that time only to accomplish mechanical cleansing of the vagina."

L. R. Wharton in "Gynecology" (Philadelphia, W. B. Saunders Company, 1943) says:

"Many perfectly healthy women who have no leukorrhea use douches two or three times a week for the sake of cleanliness. This is perfectly reasonable as long as one administers the douche properly, uses the proper solutions and keeps the apparatus clean. The greatest dangers that attend such hygienic douching are the possibility of causing local irritation by using solutions that are strong or too hot and the risk of introducing infection, due to a contaminated douche apparatus."

The chief obstacle to the use of douches in young girls is an intact hymen. For an unmarried woman with a dilated hymen due to coitus, the use of vaginal menstrual plugs or other reason, there is no reason not to prescribe douches just as for married women, provided there is a valid indication such as a malodorous discharge. For little girls, however, satisfactory treatment can nearly always be carried out by a physician without the necessity of douches. In some cases the hymenal orifice must be widened, but there should be no moral reason against this. However, it is best to explain to the child's mother not only the intention of partially dilating the hymen but also the necessity for the procedure. Most of the public and many physicians are of the firm opinion that no attempt should be made to insert a finger or even an instrument through a virginal hymen, but there are times when this must be done both for diagnosis and for treatment. It is time that physicians educated the public to the fact that a dilated hymenal orifice is not necessarily a sign of lack of virginity.

NEGRI BODIES NOT FORMED BY RABIES VACCINE

To the Editor:—In our community we always have mad dog scares. It has been my observation that, even though the animal does not possess any symptoms of rabies, almost invariably when it is killed and the head sent to either the state laboratory or the Texas A. & M. College Laboratory a report of rabies is given. It does not appear rational that there can be this many rabid animals almost continuously. I should like to know if, after vaccination of animals for rabies, the peculiar inclusion or Negri bodies are found within the cytoplasm of the ganglion cells of the central nervous system.

Joseph Corrigan, M.D., Conroe, Texas.

ANSWER.—As far as known, Negri bodies do not develop in dogs vaccinated against rabies even if vaccines of active virus are used. It appears that Negri bodies are formed only by "street" strains of the rabic virus and not by virus that has been passed through animals in the laboratory. At present only fixed virus is used in making vaccines, that is, virus which has been passed intracerebrally many times through animals. It should be kept in mind that, in dogs, unrecognized rabies probably greatly exceeds the recorded incidence.

HYPERTRICHOSIS OF ARMS AND LEGS

To the Editor:—A neurosis is developing in a young woman because of hypertrichosis of the arms and the legs. Any successful treatment of the neurosis will require consideration of the hypertrichosis, with permanent epilation if possible. What is the most successful and practical method of permanent epilation, if any? Have the x-rays been used in this way? If so, has the method been successful, safe and practical? What is the most satisfactory method of temporary removal and bleaching?

M.D., Indiana.

ANSWER.—Permanent epilation by means of x-rays is not safe and should not be attempted. The electric needle is safe and permanent but is time consuming and expensive, and, if not carefully done, it may be followed by disfiguring scars. Bleaching by means of a mixture of hydrogen peroxide and ammonia water may reduce somewhat the visibility of the hairs. If the patient can be induced to make use of an electric razor it will be found to be the simplest and most effective method of management.

TRANSFUSION OF WHOLE AND CITRATED BLOOD

To the Editor:—Immediately following or during a persistent hemorrhage is there any difference to be expected from the use of whole blood or citrated blood in transfusion? Will the two have the same value to the patient? Will the clotting of the patient's blood be materially affected either way? I assume that there is no defect in the patient's own clotting mechanism but that the blood loss is due to trauma such as would occur following an operation.

M.D., New York.

ANSWER.—Unmodified and citrated blood are equally effective in the treatment of postoperative or traumatic bleeding. Assuming that there is no defect in the patient's clotting mechanism, neither sort of blood would produce an appreciable effect on the coagulability of the blood.